REPORT

North Carolina Dept. of Agriculture
1940/1942

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REPORT

of

The North Carolina Department of Agriculture

FROM JULY 1, 1940
TO JUNE 30, 1942

REPORT

of

The North Carolina Department of Agriculture

For the Biennium 1940-1942

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Letter of Transmittal

To His Excellency, J. Melville Broughton,
Governor of North Carolina.

Sir:

In compliance with Chapter 248, Public Laws of 1929, I submit the following report of the work of the Department of Agriculture for the biennium 1940-1942.

Respectfully,

W. Kerr Scott

Commissioner of Agriculture.

Raleigh, N. C.
November 1, 1942.

REPORT

OF

THE NORTH CAROLINA DEPARTMENT OF AGRICULTURE

FOR THE BIENNIUM 1940-1942

State Board of Agriculture

W. Kerr Scott, *Commissioner*
Ex-Officio Chairman
Raleigh, N. C.

L. Y. Ballentine	Varina
W. I. Bissette	Grifton
L. L. Burgin	Horse Shoe
Charles F. Cates	Mebane
Claude T. Hall	Woodsdale
W. G. Hargett	Richlands
D. R. Noland	Clyde
Miss Ethel Parker	Gatesville
J. H. Poole	West End
Lionel Weil	Goldsboro

PERSONNEL

OF THE

STATE DEPARTMENT OF AGRICULTURE

W. KERR SCOTT, *Commissioner*

ADMINISTRATION

D. S. COLTRANE	*Assistant to the Commissioner*
A. R. POWLEDGE	*Chief Auditor*
LOUIS H. WILSON	*Editor of Publications*
MYRTHA FLEMING	*Principal General Clerk*
MAY DAVIDSON	*Senior Stenographer Clerk*
JERRIE WHELESS	*Senior General Clerk*
ROBERT HARRIS	*Janitor-Messenger*
WORTH JEFFRIES	*Janitor-Messenger*
ELIZABETH C. RABB	*Junior General Clerk*
JOSEPH A. HUNTER	*Janitor-Messenger*
ANNIE A. BRASWELL	*Senior Stenographer Clerk*
MARY FRANCES LEE	*Junior Stenographer Clerk*
KATHERINE PALMER	*Senior Accounting Clerk*
CARRIE DELL MCCALL	*Junior General Clerk*

INSPECTION

W. E. FULLER	*Junior Dairy Specialist*
E. J. HARRINGTON	*Junior Fertilizer Inspector*
CHARLES H. GODWIN, JR.	*Senior Food Inspector*
MARTIN MCCALL	*Senior Food Inspector*
G. C. BOSWOOD	*Junior Fertilizer Inspector*
HARVEY MCPHAIL	*Senior Feed and Seed Inspector*

MARKETS

R. B. ETHERIDGE	*Chief*
C. W. SHEFFIELD	*Principal Marketing Specialist*
PAUL L. FLETCHER	*Principal Marketing Specialist*
H. T. WESTCOTT	*Senior Marketing Specialist*
A. B. HARLESS	*Senior Marketing Specialist*
W. P. HEDRICK	*Senior Marketing Specialist*
WILLIARD HOLDEN DARST	*Senior Marketing Specialist*
RALPH BOGAN KELLY	*Associate Marketing Specialist*
GLADYS STRAWN	*Associate Marketing Specialist*
MARGARET C. TAYLOR	*Senior General Clerk*
MARY C. HUTCHINSON	*Senior Stenographer Clerk*
W. G. JONES	*Senior Telegraph Operator*
REBECCA MERRITT	*Senior Stenographer Clerk*
JOE B. GOURLAY	*Senior Marketing Specialist*
CARRIE MAE MANN	*Junior Stenographer Clerk*

MARKETING AUTHORITY

GEO. R. ROSS	*Principal Marketing Specialist*
W. L. ADAMS	*Associate Marketing Specialist*
CARL H. TOWER	*Associate Marketing Specialist*
N. L. BALLANCE	*Senior Marketing Specialist*
CELESTE TRIPLETT	*Senior Stenographer Clerk*
D. S. MATHESON	*Principal Marketing Specialist*
T. L. GWYN	*Principal Marketing Specialist*

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DAIRY

C. W. PEGRAM	*Dairy Specialist*
J. V. WHITAKER	*Senior Auditor*
LUCILLE THOMAS STEPHENS	*Junior Stenographer Clerk*

ENTOMOLOGY

C. H. BRANNON	*Senior Entomologist*
J. A. HARRIS	*Senior Entomologist*
C. S. BRIMLEY	*Associate Entomologist*
D. L. WRAY	*Associate Entomologist*
P. G. CRADDOCK	*State Apiary Inspector*
PAULINE P. NEWSOM	*Senior Stenographer Clerk*
JOHN BOYCE RILEY	*Japanese Beetle-Inspector*

SEED LABORATORY

J. W. WOODSIDE	*Senior Botanist*
S. D. ALLEN	*Senior Seed Analyst*
ELSIE W. EARP	*Senior Seed Analyst*
ELIZABETH FLEMING	*Senior Seed Analyst*
C. H. LUTTERLOH	*Senior Feed Inspector*
JOSHUA S. JAMES	*Senior Feed Inspector*
T. A. HOLCOMBE	*Senior Feed Inspector*
MABEL V. ROBERTS	*Junior Seed Analyst*
MRS. WM. M. STYLES	*Junior Seed Analyst*
SALLIE MAURINE TAYLOR	*Junior Stenographer Clerk*

ANALYTICAL

B. W. KILGORE	*Senior Chemist*
E. T. HORD	*Senior Chemist*
W. E. MCNEILL	*Senior Food Inspector*
L. M. NIXON	*Senior Chemist*
L. B. RHODES	*Senior Chemist*
H. D. MATHESON	*Junior Chemist*
W. P. MATTHEWS	*Associate Chemist*
Z. B. BRADFORD	*Senior Chemist*
L. V. AMBURGEY	*Microscopist*
DAVID E. BUFFALOE	*Junior Chemist*
H. F. PICKERING	*Senior Chemist*
VELVA HUDSON	*Senior General Clerk*
HEBER B. HATCH	*Principal General Clerk*
ROBERT L. HARRIS	*Laboratory Aid*
MOSES LORD	*Laboratory Aid*
GORDON POWELL	*Laboratory Aid*
THOMAS M. WARD	*Junior Chemist*
RUFUS G. MARSHBOURNE	*Junior Chemist*
SARAH D. ALLEN	*Principal General Clerk*
JOHN J. FILICKY	*Junior Chemist*
CHAS. THOMAS HOLLOWELL, JR.	*Laboratory Technician*
JAMES MANLY	*Laboratory Aid*
LACY WOOD CORBETT	*Junior Chemist*
CHARLIE HUSS	*Senior Stenographer Clerk*

CROP STATISTICS

W. T. GARRISS	*Junior Statistician*
RUSSELL P. HANDY	*Junior Statistician*
HENRY G. BROWN	*Junior Statistician*
BESSIE KELLOGG	*Senior Statistical Clerk*
SARAH DRAKE	*Senior Statistical Clerk*
RACHEL E. FISH	*Junior Statistical Clerk*
NANCY L. HOLLER	*Senior Statistical Clerk*

J. PAUL SHAW	*Junior Statistician*
ELMA S. WYRICK	*Senior Statistical Clerk*
MRS. ESPY S. BOLGER	*Senior Statistical Clerk*
HERBERT BARNES	*Senior General Clerk*
GEO. TRUETT DENTON	*Senior General Clerk*

MUSEUM

H. T. DAVIS	*Senior Curator*
H. H. BRIMLEY	*Senior Curator*
ROXIE COLLIE SIMPSON	*Preparator and Taxidermist*
OWEN WOODS	*Janitor*
PATTIE DANIELS	*Maid*
MARY KNIGHT	*Principal General Clerk*

VETERINARY

WM. MOORE	*State Veterinarian*
L. J. FAULHABER	*Associate Veterinarian*
W. R. BAYNES	*Associate Veterinarian*
WM. R. BEASLEY	*Junior Veterinarian*
W. A. JORDON, JR.	*Junior Veterinarian*
R. L. DICKINSON	*Junior Veterinarian*
L. J. FOURIE	*Senior Bacteriologist*
GRACE JOHN	*Senior Stenographer Clerk*
FRANK HALL	*Laboratory Aid*
FRANK HOWARD	*Laboratory Aid*
JAMES W. WILLIS	*Junior Veterinarian*
J. W. MCKEE	*Junior Veterinarian*
JOSEPH D. WOLF	*Junior Veterinarian*

TEST FARMS

F. E. MILLER	*Director*
KATHLEEN HARRISON	*Senior Stenographer Clerk*
J. L. REA, JR.	*Superintendent*
A. P. LEFEVERS	*Assistant Field Crops*
HERBERT ALLEN	*Assistant Livestock*
E. G. MOSS	*Superintendent*
JOE L. RAND	*Foreman*
CLIFTON M. BLACKWELL	*Assistant Foreman*
ELIZABETH FLOYD	*Senior Stenographer Clerk*
CHESTER KEARNEY	*Feed and Farm Laborer*
R. E. CURRIN, JR.	*Superintendent*
W. C. ALLSBROOK	*Foreman*
MRS. WALKER YOUNG	*Junior Stenographer Clerk*
DEAN W. COLVARD	*Junior Dairy Specialist*
J. ERNEST LOVE	*Poultryman*
W. M. WHISENHUNT	*Foreman*
R. L. YORK	*Assistant Dairyman*
W. W. ROSS	*Assistant Horticulturist*
HAZEL DRAKE	*Junior Stenographer Clerk*
SPENCE MONROE CORRELL	*Dairyman*
CHAS. T. DEARING	*Superintendent*
D. P. SOUTHERLAND	*Foreman*
C. O. BOLLINGER	*Poultryman*
FRANK J. VEACH	*Foreman*
FRED STEVENS, JR.	*Dairyman*
B. L. WILLIAMS	*Junior Stenographer Clerk*
J. W. HENDRICKS	*Superintendent*
ROSE E. BRADFORD	*Junior Stenographer Clerk*
JOHN S. KING	*Foreman*
FRED EDMINSTEN	*Animal Feeder*

BLISTER RUST

HOBART A. WHITMAN	*Inspector*

SOIL TESTING

J. F. REED	*Senior Agronomist*
GRAFTON C. PRICE	*Associate Chemist*
MRS. J. F. JEFFREYS, JR.	*Senior Stenographer Clerk*
VIRGINIA L. SPRUILL	*Senior Stenographer Clerk*
ARTHUR GILES	*Laboratory Aid*

STATE WAREHOUSE SYSTEM

A. B. FAIRLEY	*Superintendent*
FRED P. JOHNSON	*Cotton Gin Specialist*
C. R. REYNOLDS	*Chief Cotton Classer*
MRS. J. N. MASON	*Senior Stenographer Clerk*
MRS. HALLIE K. MORROW	*Senior Stenographer Clerk*
J. B. HAYWOOD	*Cotton Classer*
E. L. UPCHURCH	*Senior General Clerk*
A. W. OUTTERBRIDGE	*Junior Warehouse Examiner*
CORA HERNDON	*Junior Stenographer Clerk*

WEIGHTS AND MEASURES

C. D. BAUCOM	*Superintendent*
H. W. HOOD	*Inspector*
JOHN I. MOORE	*Inspector*
S. M. WOOLFOLK	*Inspector*
ROBERT W. PARKER	*Inspector*
DORIS E. POWELL	*Junior Stenographer Clerk*
W. C. BARNETT	*Inspector*
WAVERLY LUCAS	*Helper*

N. C. STATE FAIR

J. S. DORTON	*Manager*
G. C. ELLIS	*Caretaker*

COOPERATIVE INSPECTION SERVICE

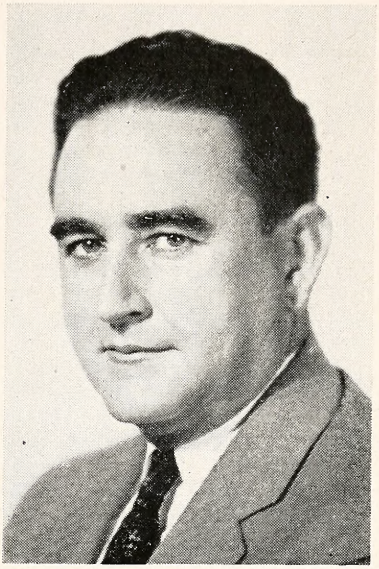
E. G. HARGIS	*Egg Grader*
H. D. WILSON	*Egg Grader*
WM. B. JONES	*Egg Grader*
S. M. JAMES	*Egg Inspector*
D. A. BASS	*Egg Grader*
L. D. EDWARDS	*Egg Grader*

CREDIT UNION

D. R. GRAHAM	*Supervisor*
JEANETTE COHEN	*Junior Stenographer Clerk*
A. S. BYNUM	*Junior Auditor*

BIENNIAL REPORT
OF THE
NORTH CAROLINA DEPARTMENT OF AGRICULTURE

By W. KERR SCOTT
Commissioner of Agriculture



W. Kerr Scott

North Carolina has become the first State to conquer Bang's disease, a serious threat to the dairy and cattle industry, and marketing services have been enlarged substantially by the State Department of Agriculture which has kept abreast with the general "march of progress" throughout the State during the biennium.

The creation of the State Marketing Authority by the 1941 General Assembly has enabled the Department to promote, encourage and develop an orderly and efficient marketing program which is essential to the economic well-being of our rural life.

The Department, working coöperatively with Federal authorities, has established an enviable record by becoming the first State to control Bang's disease, a serious malady of cattle that interferes with production, reproduction and the general growth of the cattle industry. A further contribution to the livestock development of the State has been made under a coöperative program whereby stocker and feeder cattle are purchased in Western counties for resale to Eastern Carolina farmers.

Maintenance of a rigid inspectional and control program has also resulted in North Carolina becoming the first Southern state to eradicate phoney disease, serious malady that kills peach trees.

Virtually all programs of the Department have been geared for the war effort and invaluable service has been rendered the armed forces and farmers under the expanded program of the marketing division.

Increases in the number of soil samples tested for farmers have been recognized as a definite contribution to the food-for-victory program. Soil testing, a comparatively new service of the Department, has enabled farmers to secure accurate information on the plant food content of their soil and further

provides them with concrete information as to the most suitable fertilizer that will give a maximum production at minimum cost.

The regulatory, inspection and control laws enforced by the Department have been amended to provide greater protection for the farmers as well as for the honest manufacturer.

A summary of the Department's achievements and progress during the biennium follows:

Accounts: Business-like and approved accounting methods followed have resulted in increased efficiency in this division. Accounting methods employed have been satisfactory and have brought commendation from the State Auditor's Bureau of Departmental and Institutional Auditing.

Chemistry: A total of 14,207 samples of fertilizers, fertilizer materials, feeds, cottonseed meal, lime and land plaster, fungicides and insecticides have been analyzed during the biennium. Inspection of plants manufacturing or distributing foods totaled 6,546 and in addition 7,965 labels on packages of foods were examined in connection with the enforcement of regulatory and inspectional laws.

Laboratory facilities have been modernized to permit greater efficiency.

Credit Union: Thirty-eight new credit unions were organized during the biennium and an increase of approximately $600,000 in assets (cash on hand, money in banks and government bonds) reflect substantial growth. Credit unions made 57,611 loans aggregating $5,158,986 during the biennium. The 27,094 members in the State accumulated resources of $2,105,582.

Dairy: Milk purchases, as reported by plants, increased approximately 100 per cent from 1939 to 1941 and the enforcement of the Babcock Test Law has had a wholesome effect on the growth of the dairy industry. Approximately 30,000 check tests for butterfat were made in connection with 1,642 investigations at 90 plants, compared with 5,177 checks during the previous biennium.

Enactment of the Milk Audit Law in 1940 has resulted in a saving of thousands of dollars as a result of the elimination of the "loose" buying and trade practices that previously prevailed in the milk industry. The law has resulted in greater stabilization of purchase procedure relating to plants and the dairy farmers.

Entomology: Satisfactory results have been obtained in the program to control the spread of Japanese beetles, enemy of over 300 agricultural plants.

North Carolina is the first Southern State to eradicate phoney disease of peaches, a serious malady that kills peach trees. By controlling phoney disease, the peach industry in North Carolina has been saved from "certain" destruction, which would have followed the uncontrolled condition of this malady throughout the State.

Bee disease work especially in Eastern North Carolina has made excellent progress.

Division of Markets: The State Marketing Authority was enacted by the 1941 Legislature to promote, encourage and develop the orderly and efficient marketing of the products of the home and farm. Under this program marketing assistance was given in connection with the sale of 1,483,024 packages of fruits and vegetables, 106,430 pounds of pecans, 676,769 pounds of poultry and 3,030 cases of eggs and miscellaneous farm products which brought farmers an aggregate of $2,288,979. Assistance was rendered also in selling produce amounting to $539,783 to army camps in the State.

A coöperative livestock promotion project with the Highway and Public Works Commission has resulted in the purchase of stocker and feeder cattle from Western counties for resale in Eastern counties. Sales have totaled $52,486,730.

A total of 29,010 cases of surplus eggs were marketed for farmers under a coöperative program.

N. C. State Museum: "Birds of North Carolina," sponsored by the Department and issued by this division, is one of the most significant books ever published by a State agency and is an invaluable contribution to the natural history of the State and Nation.

Substantial progress has been made in acquiring new exhibits, re-arranging old exhibits and the programs serving to better acquaint the public with the natural history and natural resources of the State.

Schedules of hours have been re-arranged to accommodate the ever-increasing flow of visitors from the armed forces to the Museum.

Publications: More than 30,000 farmers and others receive the "Agricultural Review," bi-monthly publication devoted to agricultural information such as reports on regulatory, inspection, control and marketing problems.

A news picture service has been enlarged. Farm bulletins have been enlarged, better illustrated and indexed for the benefit of farmers and others.

Newspapers and press associations have been constantly informed on the activities of the Department and the services offered agriculture and related industries.

Seed Laboratory: The number of seed samples tested for germination and purity has increased nine per cent compared with the previous biennium. A total of 26,038 samples of seed have been tested in connection with the program to assure farmers of a market for seed of known value.

Today the North Carolina seed label provides information that enables farmers to more intelligently purchase their seed and the seed laboratory is attaining increased recognition in the general food-for-victory program.

Soil Testing: Because of the shortage of nitrogen for fertilizers and the need for greater economy in transportation as a result of the war conditions, soil testing has become of increased value to the farmers. Approximately 25,000 samples were analyzed for growers who were furnished accurate information on the plant food content of their soil and given concrete recommendations as to the most suitable fertilizer necessary to give maximum production at minimum cost.

State Fair: The Great State Fairs of 1940 and 1941 were operated successfully both from an educational and financial standpoint. Record breaking crowds saw both exhibitions. At the 1941 exposition 92,000 square feet of exhibit space was devoted to agricultural, industrial and educational displays in addition to 25,000 square feet provided under two tents for the livestock interests. Premiums paid to exhibitors have been increased substantially each year.

Statistics: Agricultural statistics, which are basic to all programs including the war effort, have been made available promptly to all war agencies in connection with the food-for-victory program. Many new crop reports and farm statistic summaries have been established, making the services of this division of inestimable value in connection with the present emergency. The farm labor and price surveys have been especially valuable. The county data have become essential in the services rendered.

A total of 366 reports are made by the division annually, involving the services of more than 30,000 voluntary crop reporters divided into 64 groups.

Test Farms: The research program of the six outlying Branch Experiment Stations consists of 126 experimental projects, which are handled coöperatively with the North Carolina Agricultural Experiment Station, and in many instances with the United States Department of Agriculture. Several of these projects have been revised in order to comply with requests to aid more directly National Defense measures in agriculture, and new tests have been begun for the same purpose.

Much improvement work has been completed during the biennium, including repairing and painting buildings, clearing and draining land, and fencing grazing areas. New machinery and implements have been purchased and 80 acres of land near the Tobacco Station have been provided for tobacco research plot land.

The War Department has taken over the Mountain Test Farm property as the site for the location of an Army casualty hospital and steps are being taken to relocate this Station. In addition to carrying forward the experiments conducted on the old location, new experiments will be undertaken on the new site to include beef cattle and sheep.

Because of damage by fire to land, fencing, and vegetation, plans are being made to relocate the Blackland Experiment Station. While most of the projects will be moved to the new location, several long-time experiments will be continued on the present location in order to obtain the necessary information to conclude the experiments.

Veterinary: Bang's disease, a serious threat to the Nation's dairy and cattle industry, has been conquered in North Carolina by a corps of veterinarians who have established a national record for the State in a concerted animal-disease war that has been waged for eight years.

To become an accredited State, all cattle in all counties have to be tested and Bang's disease infection has to be less than one per cent of all cattle.

Previously North Carolina became the first State in the Nation to accredit all counties in the bovine tuberculosis control program.

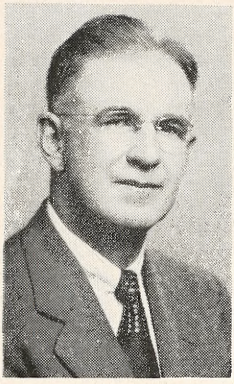
Progress has been made in control of hog cholera and rules and regulations have been adopted and enforced in the general program to control livestock diseases and promote the growth of the livestock industry.

Warehouse: During the year 1941-1942, a total of 542,224 bales of cotton was handled by the Warehouse division, representing about seven per cent of the year's total crop.

The division has made a substantial contribution to the ginning improvement program with the result that gin damaged cotton has been reduced 2.5 per cent annually for the past three seasons and reached a new low of 6.8 per cent in 1941.

Weights and Measures: A Scale Mechanic Act was passed by the General Assembly for the protection of both the owners of scales and honest mechanics. The Weigh Master Act, passed in 1939, now has the full approval and support of all parties concerned.

State inspectors visited 11,225 concerns where scales, weights, dry measures, liquid measures, packages and deliveries were checked for compliance with the Weights and Measures Law. This involved 147,042 inspections.



D. S. Coltrane

Administrative and Regulatory Activities

1940-1942

D. S. Coltrane
Assistant to the Commissioner

Agricultural Production: Our country has again been plunged into an unprovoked war for its very existence, a struggle in which it is vitally essential that all people and all industries coöperate and produce with the utmost energy and determination if we are to perpetuate this nation.

Agriculture has a task, the size and importance of which cannot be over-emphasized at a time like this. It is to the successful prosecution of this task that the farmers of North Carolina have dedicated themselves with a "will to win" that will minimize inconveniences and overcome difficulties, of which there have been many. The acute shortage of farm labor and the prevailing high wages brought on by war conditions have combined to constitute a serious menace to agricultural well-being in this state. It is urgent that our Government take immediate steps to alleviate this condition, or, certainly, to prevent its seriousness from increasing. In spite of this and other handicaps which have hampered farmers, the agricultural progress and production of North Carolina for the past biennium has been steadily forward and upward. Certain crops vital to the war effort have been increased tremendously. Peanut production has jumped from 265,640,000 pounds in 1941 to 396,800,000 for 1942 and soybeans from 1,710,000 bushels in 1941 to 3,552,000 bushels for 1942, which is an all time record for both these crops. Cotton has moved from 552,000 bales in 1941 to an estimated 736,000 bales for 1942, and the estimated yield per acre is indicated at 415 pounds or 25 per cent higher than 1941. While the corn crop acreage has decreased, the acreage planted to barley has increased from 9,000 acres in 1937 to an estimated 36,000 acres for harvest in 1942. As of January 1, 1942, the number of all livestock increased only slightly from January 1, 1941, but the value increased 21 per cent over a year ago, with hogs showing a 71 per cent increase in value. North Carolina ranks 14th in number and value of hogs. Sheep numbers showed a two per cent increase with values four per cent up. The number of all chickens on farms, excluding commercial broilers, increased 17 per cent, while turkeys increased 20 per cent in number, with a total increased value for chickens and turkeys of 42 and 47 per cent respectively. All cattle and milk cows both increased

three per cent in numbers on farms, value increased 33 per cent over a year ago.

The dairy industry in particular has made outstanding gains in recent months, with the production of wholesale Grade "A" milk for the month of July, 1942 totaling 11,137,991 pounds, the highest ever recorded by the State Department of Agriculture and exceeding the production for the same period of 1941 by 2,000,000 pounds. The figures do not include the production of producer distributors which has also greatly increased. The indications are that milk production will continue to rise, as will also the number and value of milk cattle in the State, in which we rank about twenty-fifth at present. In the total number and value of all livestock, North Carolina ranks 22nd.

North Carolina continues to rank first among the states in tobacco production, second in lespedeza seed, second in peanuts and third in sweet potatoes. In the production of peaches the State has moved from twelfth place in 1940 to fifth in 1941, and in the production of tomatoes from twenty-second in 1940 to fifteenth in 1941, and the same is true of several other crops. The State ranks very high in the production of intermediate early snapbeans, cantaloupes, green peppers, and cucumbers for both marketing and processing. North Carolina at present ranks fourth in the nation in cash income from all crops, and will probably rise to third place at the close of the 1942 market season.

These facts indicate that the farmers of the State are vigorously supporting the war effort with that enthusiasm and patriotism for which the people of North Carolina have always been noted.

PERSONNEL

Agriculture is the basic industry of North Carolina. The State ranks second in total farm population, with the 1940 census showing that 1,624,000 of our people actually live on 278,276 farms, which number is only exceeded in the State of Texas. Therefore, the State Department of Agriculture is very properly one of the major branches of the Government and the one whose work probably touches the lives and affects the welfare of more people than any other agency in the State. Because of this fact, it is very important that the employees of this Department remain at all times aware of the great trust and responsibility this imposes upon them and it is gratifying to close another biennium with the feeling that our employees have built and maintained a good record of diligence, efficiency, and interest in their work. They have proved their loyalty to the Department of Agriculture as well as to the countless thousands of citizens throughout the State whom this Department has endeavored to serve. The administrative division desires to express its sincere appreciation of this loyalty and of their industry in the

discharge of those duties assigned to them. Unfortunately for us, many of our best trained employees have gone to other fields of work as well as into the armed forces of the country and it is becoming increasingly difficult to replace them with others who are qualified, due to our low salary scale as compared with that prevailing in private industry. We take pride, however, in herewith listing the names of those of our former employees who are as of October 21, 1942 serving in the various branches of our fighting forces:

Administration:
C. P. Deyton

Analytical:
James A. Belton
J. O. Dunston
Charles C. Oates, Jr.
W. C. Hammond, Jr.
J. S. Pittard
L. W. Purdy
Charlie L. Sellars
Edwin L. Combs

Crop Statistics:
William T. Wesson

Entomology:
C. H. Hill

Soil-Testing:
I. E. Miles
Frank H. Brown

Veterinary:
C. B. Randall
Wayne D. Collins

Warehouse:
Robert S. Pou

Weights and Measures:
George S. Turner
Wade M. Manness

We feel duty bound to the agricultural interests of this State to voice here our feeling that since agriculture is the basic industry of North Carolina, with a tremendous investment, and since the services of the Department of Agriculture directly affect that industry, then the work of this Department should not be made to suffer because of our inability to offer salaries sufficient to secure capable and trained workers. When we consider that 1,624,000 people live on 278,276 farms, valued at $736,708,000, to say nothing of the additional millions invested in crops and livestock, we are constrained to believe that services should not be crippled which affect very greatly the welfare of these people, as well as the entire citizenship in general, and the safety of this investment. We are now directly confronted with this problem, the magnitude of which merits full consideration.

A ten per cent increase in the salaries for the personnel of the Department has been requested for the coming biennium in view of the increased cost of living and in order to maintain an efficient staff that is being rapidly decreased because of the lucrative offers by war industries, other industries, the Federal Government and the armed forces.

Trained personnel must be maintained at all times, and adequate salaries must be paid commensurate with the standard of living now prevailing unless the regulatory, inspection, control and marketing programs and other programs of the Department suffer irreparable losses.

Too much emphasis cannot be given to the fact that many substitutes, coming under the jurisdiction of the regulatory and control divisions of the Department, are being offered the consumer today and the need for a continuation of rigid enforcement of the laws to protect the buyer was never more apparent.

Over a period of years, sizeable investments have been made in preparing or training the Department's staff in specialized work and if these investments are to be protected, nominal salary increases must be made.

Living expenses are up ten per cent or more, income taxes and other taxes are steadily climbing, all of which emphasize the need of salary increases which are essential to the maintenance of reasonable standards of living.

COOPERATION WITH AGRICULTURAL AGENCIES

A splendid spirit of coöperation exists between the Department and the other agencies serving the agricultural interests of North Carolina.

Whenever regulatory, inspectional and control problems have arisen, the North Carolina Agricultural Experiment Station, State College Extension Service, farm organizations, farmers, representatives of farm industry and others have united in an effort to formulate practical programs that will result in fair, impartial and worthwhile contributions to the farm life of the State.

The necessity of correlating regulatory, inspectional, control, agricultural research and other agricultural services for the benefit of the farmers has been given greater recognition and emphasis during the past biennium than perhaps at any time in the history of North Carolina agriculture.

REVENUE

The detailed financial statement shows the sources and amounts of revenue collected by the Department during the biennium. The total receipts for that period amount to $1,156,189.32 as compared with $995,799.60 for the previous biennium, which shows an increase of $160,389.72. This is accounted for largely by an increase in the sale of fertilizer and feed tax tags alone amounting to $110,034.43. The continued strict enforcement of the Seed Law and a general growing understanding and appreciation of it resulted in an increase of $6,719.07 from seed dealers' licenses and seed analysis tags. Most other sources of revenue also resulted in slight increases, with the notable exception of oleomargarine tax which showed a $1,446.50 decrease.

Receipts of the Department for the fiscal year 1940-41 were $558,250.99 while the expenditures amounted to $513,385.15. Receipts exceeded expenditures by $44,865.84. In the fiscal year 1941-42 receipts were $597,938.33 while expenditures amounted to $583,015.52. Receipts exceeded expenditures by $14,922.81.

According to the sale of Agricultural Lime tax stamps, there has been sold through the regular channels of trade during the biennium a total of 101,906 tons of Agricultural Lime, which does not include shipments to fertilizer manufacturers for mixing purposes. The inspection tax on this product is five cents per ton and was levied by the 1937 General Assembly for the purpose of enlarging the peanut research programs. The receipts from this source for the biennium amounted to $5,095.30. However, this represents only a small part of the Agricultural Lime which has been distributed in the State. During the two-year period from November 1, 1940 through October 31, 1942, there has been distributed by the Agricultural Adjustment Agency of the Federal Government a total of 609,553 tons. These figures are reported from the office of Mr. E. Y. Floyd, State Administrator for that Agency. If the Department of Agriculture had received the five cents per ton inspection tax on this lime, it would have amounted to $30,477.68. In addition, Mr. Floyd reports that during the above mentioned period a total of 45,317 tons of phosphate was distributed without payment of the inspection tax of 25 cents per ton. If the Department of Agriculture had received this, it would have amounted to $11,329.28. The same agency also distributed approximately 100,000 bags of peanuts during 1942 without payment of the inspection tax of one cent per bag, which would have amounted to $1,000.00, making a total of at least $42,806.96 additional revenue which this Department would have received had it been permitted to collect the usual inspection fees.

FERTILIZER

The purpose of the North Carolina Fertilizer Law is to afford protection to the users of commercial fertilizer against the possible misbranding of the grade or value of the fertilizer sold in the State. As an inspection and regulatory agency, the Department realizes that no part of its work is more important than strict enforcement of the Fertilizer Law. Changes in the Act were made during the biennium by the 1941 Legislature with the view of giving the farmers, manufacturers, and dealers greater protection, simplified labeling provisions, higher analysis fertilizers, and a restricted grade list.

New Fertilizer Law

Department officials are of the opinion that the revised law, which became effective on December 1, 1941, gives us on the whole the best law of any State in the Nation, and rightly so because our farmers use more fertilizer than any State in the Union. The form of statement for guarantees has been simplified so as to make it possible for a manufacturer who operates in adjoining states to use bags and tags interchangeably in the

different states. The penalty provisions of the Act have been tightened so as to give the farmers more protection.

Red Tag for Low Grade Fertilizer

An outstanding change in the new law is a provision which recognizes all fertilizer containing less than 16 units of plant food to be labeled with a "red tag" reading as follows: "This is a low grade fertilizer. It costs too much per unit of nitrogen, available phosphoric acid and potash because it contains only 14 or 15 units (whichever the case may be) of these plant foods. You are paying too much for bagging, freight, labor, etc., on too much inert material."

The "red tag" will be of educational value to those farmers who have been purchasing 3-8-3 because of habit. It will reach the farmer who has not kept himself informed as to the amount of filler in low grade fertilizer.

Grade Restriction

Another outstanding change in the law is a provision which gives the State Board of Agriculture and the Director of the Agricultural Experiment Station authority to set up, from time to time, a list of grades consisting of not more than fifty and not less than thirty-five grades. This provision of the Act will, in all probability, result in a saving of a million dollars or more to the farmers of the State. Manufacturers have heretofore made a multiplicity of grades for which there had been but little demand. In 1937 a total of 202 grades were registered for sale in this State.

Thirty-six Grades Adopted

Following the policy of the Department, an informal conference with Farmers, Fertilizer Manufacturers, Dealers, and Agronomists, was called to consider the grades that should be recommended to the Board and Director of the Experiment Station. After much discussion, the conference passed a resolution in favor of restricting the grades to the minimum allowed by the law, and then proceeded to suggest a list of 35 grades. This list was adopted by the Board of Agriculture with but one addition, making an official list of 36 grades that were sold during 1942.

Other Changes in the Law

Other changes in the law are briefly enumerated as follows:

1. *Registration.* Registrations have been changed from a five-year period to an annual basis. The present registration period is December 1 through November 30. The annual registration fee is $2 per brand. If packed in five-pound packages or less, the registration fee is $25 per brand. Failure to register carries a maximum penalty of $500.

2. *Weight.* Must be "net weight" rather than "gross weight."

3. *Nitrogen Guarantees.* A manufacturer may guarantee either total nitrogen or available nitrogen. If the wording Total Available Nitrogen is used, it will be interpreted as Total Nitrogen. This is permitted in order to bring about uniformity with the South Carolina law and thereby enable manufacturers who do business in both states to use the same guarantees.

4. *Water Insoluble and Nitrate Nitrogen Guarantees.* These guarantees are made in percentage of the total, expressed in whole numbers, rather than the decimal fraction thereof. In our opinion, this is much more desirable because it was possible under the old law for a guarantee of either Nitrate or Water Insoluble Nitrogen in the decimal to be very misleading; whereas, it is almost impossible for a farmer to be misled when the guarantees are stated in percentage of the total.

Optional Guarantees

Minimum per cent of Magnesium Oxide.
Minimum per cent of Calcium Oxide.
Minimum per cent of Sulphur in General Crop Fertilizer.
Minimum-Maximum percentage of Sulphur in Tobacco Fertilizer.

Lowering Analysis or Quality Not Permitted

A manufacturer is not allowed to lower the quality of any established registered brand.

Penalties

All tolerances for deficiencies are decreased; thereby, strengthening the penalty provision of the law.

Basic Slag

A Basic Slag must carry a guarantee for both total and available phosphoric acid. The old law provided only for a guarantee of total phosphoric acid.

WAR ECONOMY NECESSITATES ELIMINATION OF LOW GRADE FERTILIZER

An educational campaign has been carried on during the past five years to familiarize farmers with the savings to be effected by the purchase of higher analysis fertilizers. War has been waged against the most uneconomical grades such as 3-8-3; 2-9-3; 0-10-4; and 2-8-4. All of these grades have been omitted from the restricted grade list except 3-8-3 which is now a "red tag" low grade fertilizer. This grade still represents about 20% of the total tonnage used in the State. While an educational campaign has been waged against this grade with some results, our war economy has brought about a necessity for the total elimination of this grade. With the shortage of labor, bags, and transpor-

tation, it is almost imperative that we eliminate from the list of grades any fertilizer that contains more than 200 pounds of worthless filler to the ton.

Filler and Defense

In normal times it may be proper for a farmer to buy an uneconomical grade of fertilizer put in war times such a policy materially injures our defense efforts.

Normally, a very important part of our domestic freight is hauled by coastwise and intercoastal ships. Many of these ships have been diverted to war use, and more could be used with great benefit if they could be spared from normal traffic. This diversion of ships, added to the greatly increased need for transportation due to war work, has begun to place a strain on our rail and truck transportation also. It is, therefore, becoming increasingly important to economize in transportation in every legitimate way.

It is not feasible to prohibit entirely the use of filler because some filler is desirable to adjust formulas, inasmuch as grades are required to be stated in whole numbers, as well as for other reasons. Nevertheless, approximately 80,000 tons of unnecessary filler could be eliminated with real benefit to agriculture, the fertilizer industry, and the defense of our country.

FERTILIZER SALES

Consumption of commercial mixed fertilizer and fertilizer materials for North Carolina farmers based on tag sales for the fiscal year July 1, 1940, to June 30, 1941, was 1,113,327 tons; whereas, the consumption for the year July 1, 1941, to June 30, 1942, was 1,194,174 tons. The tonnage for the biennium amounted to 2,307,501 tons which represents an increase from the previous biennium by 80,847 tons, or seven per cent.

FERTILIZER INSPECTION

Reasonable fertilizer inspection services have been provided during the past two years. During the peak season a total of 15 part-time inspectors actively covered their respective territories. An effort was made to get samples from every company in proportion to the tonnage sold. Also, a determined effort has been made to get more samples directly from the farms rather than from dealers. During the year 1940-41, inspectors made 6,138 inspections, and during the year 1941-42, 7,697 inspections, or a total of 13,835 inspections for the biennium. This is compared with a total of 8,403 inspections for the previous biennium. During the year 1940-41, inspectors secured 5,779 official samples. During the year 1941-42, they secured 4,547 samples, or a total for the biennium of 10,726. These figures show that the Department's inspectors secured during this biennium 853 more samples than for the previous biennium.

One sample of fertilizer was taken for approximately each 200 tons sold. In our opinion, more samples should be taken—at least one sample for each 100 tons sold. However, this would necessitate the appointment of more inspectors as well as increased laboratory facilities and the employment of additional chemists.

FERTILIZER OF GOOD QUALITY

Reasonable quality in the fertilizer sold in this State is indicated by the fact that during the biennium penalties were assessed on only 731 lots of fertilizer obtained from 10,180 official samples analyzed and reported, which means that approximately seven per cent of the fertilizer was subject to a penalty.

If inspection figures are indicative of the fertilizer movement as a whole, this means that 95 tons of every 100 tons of fertilizer sold in the State either meet the guaranteed analysis or are found within the variations allowed in the Fertilizer Law.

$1,126,671 EXCESS PLANT FOOD

A study of the average value of fertilizer for the years 1939, 1940, and 1941 reveals that manufacturers gave North Carolina farmers an average of 53 cents per ton value in excess of plant food guaranteed, or an excess of plant food value during these two years of $1,126,671.

These facts substantiate the value of rigid enforcement of regulatory measures and are indicative of the protection given farmers as well as manufacturers.

The Department invites farmers to request inspectors to take special samples; in fact, more farm samples are desirable. We are looking forward to the day when we will secure at least 50 per cent of the total samples from the farmers, but this will have to await the day when tires and gasoline are no longer rationed as in the present emergency.

FEED SALES AND INSPECTION

During the biennium, beginning July 1, 1940, and ending June 30, 1942, a total of 3,110 feed samples were selected for chemical analysis and microscopical examination. Of these, 3,046 were official feed samples and 64 were samples of Canned Dog Foods. Computed from the sales of tax tags, there were 388,587 tons of commercial feed sold during the year July 1, 1940—June 30, 1941, and 448,850 tons during the year July 1, 1941—June 30, 1942, or a total for the biennium of 837,437 tons compared with 725,867 tons for the previous two years.

According to the sale of tax tags and stamps, there were sold 128,254 tons of Cotton Seed Meal during the fiscal year July

1, 1940—June 30, 1941, and 96,831 tons during the fiscal year July 1, 1941—June 30, 1942, or a total for the biennium of 225,085 tons as compared with 180,434 tons for the previous two-year period. The decrease in consumption of Cotton Seed Meal for the year July 1, 1941—June 30, 1942, is due to an increased use of Soybeans and Peanuts which is reflected in the 60,263 ton increase of commercial feeds. If Cotton Seed Meal is counted as feed, there was a total tonnage of 1,062,522 during the biennium compared with 906,301 tons for the previous biennium or a net gain in total feed sold of 156,221 tons.

From all sections of the State, the inspectors have collected 3,110 samples of mixed feeds. A reasonable number of samples were secured from each company and extra precautions taken to secure samples of brands previously found below the guaranteed analysis.

During the biennium, a total of 13,784 bags of feed were withdrawn from sale for various violations of the Feed Law and the registration of eight brands was cancelled. Where the violations were of a technical nature, the feed was released for sale after adjustments were made according to the law; however, 584 bags were returned to the manufacturer, 210 bags to North Carolina Mills, and 279 bags to out-of-state mills. Penalties aggregating $312.55 have been assessed during the biennium to cover the costs of feed seizures.

Using the Department's analyses, both chemical and microscopic, as an index, the feed sold in this State during the biennium, on the whole, equalled the guaranteed analysis. Much progress has been made during the past six years. Anyone can now buy feed with reasonable assurance that it will contain the guaranteed ingredients and that the chemical analysis will be as labeled. Feeds are labeled so that the least informed farmer should not be deceived. The best information and protection the purchaser of feed has is the tag and the honesty and reliability of the manufacturer. The record of any manufacturer may be obtained by reading the Department's annual Feed Bulletin. There has been a shortage of some ingredients during the past eighteen months due to war conditions; in fact, the use of some ingredients has been restricted by the Federal Government. It has been difficult to overcome the shortages of some of these materials by substitutes. Some manufacturers were quick to take advantage of the situation by loose practices in the use of substitutes and other irregularities. They asked leniency because of the National Emergency. This Department has taken the position that good quality feeds are most economical under normal conditions; and that at this time of emergency, when high production of meat, milk, eggs, cheese, and livestock is so essential, the most efficient and effective control is highly desirable.

During the two years a total of 14,684 bags of feed were withdrawn from sale for various violations of the feed law as follows:

No tax tags	8,557
Obsolete tags	121
No guarantee or tax tags	1,571
No guaranteed analysis	806
Not registered	705
Non-compliance with guarantee	1,665
Metal hooks	473
No. of bags returned to North Carolina mills	176
No. of bags returned outside mills	610
Total sales in tons (Mixed feed, cotton seed, soybean, and peanut meals)	1,062,522
Amount of penalties assessed and paid	$240.68

1,202 cases of Canned Dog Foods were withdrawn from sale because of not being registered and properly stamped.

SEED INSPECTION

The 1941 General Assembly further revised and brought the State Seed Law up to date. The act is so patterned as to work well in coöperation with the Federal Seed Act. Under an agreement between the Commissioner and the Agricultural Marketing Service of the United States Department of Agriculture relative to the enforcement of the Federal Seed Act, our seed inspectors are authorized to sample interstate movements of seed for the Federal agency. One of the first convictions for violation of the Federal Seed Act was based on evidence furnished by this division.

The seed laboratory tested a total of 26,038 samples of seed during the biennium, which is an increase of 9 per cent over the previous one. Seed inspectors withdrew from sale 226 lots of seed, covering 9,402 bags, which were being sold in violation of the law. Five wholesale distributors of vegetable package seed were cited for a hearing before representatives of the State Department of Agriculture and the Attorney General because of the low quality seed sold in the State during 1941, with the result that 16 per cent more of these seed sold in the 1942 season exceeded the standard than was the case in 1941. In twenty-one other cases of law violation in selling bulk field and vegetable seed the responsible parties were called in for hearings. In most instances the seed were released for sale after the law had been complied with and satisfactory adjustments made. Seed inspectors have called regularly on all seed dealers, have made 14,534 inspections, and collected 2,640 official samples of seed during the biennium.

In line with a general improvement in the seed situation in North Carolina the Board of Agriculture has adopted grades and standards for lespedeza seed. No more than 2,500 dodder per pound are now allowed in lespedeza offered for sale in this State as against 5,000 per pound formerly permitted, and the per-

mitted noxious weeds in small grains have been reduced from 200 per pound to 100 per pound. Recent figures show that 26 per cent more of the Korean lespedeza and 14 per cent more Kobe lespedeza seed offered for sale in the past season were of North Carolina Grade 1 quality than during the previous seasons. We feel that the progress made in the better seed program has only been possible through the coöperation of seed dealers and farmers, the great majority of whom now realize the vital importance of seed control measures in promoting and maintaining agricultural production.

Unfortunately, there has recently developed considerable misunderstanding between this Department and certain agencies of the Federal Government relative to the wide distribution of seed in this State without complying with the State's seed regulations, which were enacted for the protection of the farmer. The State Department of Agriculture has been restrained by Federal authorities from interfering in the distribution of such seed, and there have been notable cases where the consumer has suffered because he did not receive the services and protection offered by the Seed Law. In addition, the licensed seed dealers of the State have suffered from such unregulated business competition and this in turn will be reflected in a loss of revenue which supports the seed inspection and testing service. The result will be a regretable tendency toward breaking down the seed improvement program in the State, a program which this Department has emphasized and promoted for several years with gratifying results. We feel that it would be unfortunate in the extreme to relax in the effort to go forward with this work, and we feel that there is involved in this dispute a very real threat to the seed improvement program. Efforts are being made to find a mutually satisfactory solution to the problem and it is to be hoped that the situation will not long continue as it exists at present.

SUMMARY OF INSPECTION WORK

FERTILIZER

Number of inspections	13,835
Number of official samples taken	10,180
Number of tons sampled	64,528
Number of lots seized for various violations	156
Number of penalties assessed	731
Aggregate amount of penalties assessed	$11,203.37

FEED

Number of inspections	19,648
Number of tons sampled	5,478
Number of official samples taken by inspectors	2,438
Number of bags represented by samples	103,560
Number of miscellaneous samples	672
Number of samples analyzed	3,110
Number of seizures for various violations	305
Number of bags in seizures	14,684
Number of bags returned to mills	786
Number of registrations canceled	7
Aggregate amount of penalties assessed	$240.68

SEED

Number of inspections	14,534
Number of official samples taken by inspectors	2,640
Number of individual samples	23,398
Number of samples analyzed (total)	26,038
Number of lots withdrawn for various violations	226
Number of bags in seizures	9,402
Aggregate amount of penalties assessed	$34.00

ACCOUNTS

A. R. POWLEDGE

Accounting methods have been satisfactory and have brought commendation from the State Auditor's Bureau of Departmental and Institutional Auditing.

The financial report of the Department and its divisions follows:

A. R. Powledge

FINANCIAL STATEMENT

STATEMENT OF DISBURSEMENTS

July 1, 1940-June 30, 1942

	1941-42	1940-41
I. ADMINISTRATION		
Board of Commissioners	$ 1,088.36	$ 1,670.70
Salary—Commissioner	6,000.00	6,000.00
Salaries and Wages	21,052.17	21,471.84
Supplies and Materials	908.33	934.92
Tags	8,567.76	6,855.97
Postage, Telephone, Telegrams and Express	2,373.76	1,687.18
Travel Expense	1,770.73	2,025.29
Printing and Binding	6,670.05	5,675.15
Repairs and Alterations	100.00	98.95
General Expense	143.09	95.82
Equipment	222.65	407.93
Legislative Representative in Washington, D. C.	500.00	500.00
TOTAL	$ 49,396.90	$ 47,423.75
II. INSPECTION		
Salaries and Wages	$ 10,012.66	$ 7,556.00
Salaries and Wages, Extra	4,460.00	5,552.00
Supplies and Materials	89.10	199.99
Postage, Telephone, Telegrams and Express	550.87	422.26
Travel Expense	19,520.96	20,547.83
TOTAL	$ 34,633.59	$ 34,278.08
III. MARKETS		
Salaries and Wages	$ 33,145.27	$ 38,418.55
Salaries and Wages, Extra	390.67	889.00
Supplies and Materials	599.48	1,180.83
Postage, Telephone, Telegrams and Express	861.40	1,194.09
Travel Expense	7,094.54	11,079.74
Printing and Binding	235.02	289.98
Repairs and Alterations	66.66	50.00
Market News Service	618.51	850.00
Subscriptions and Dues	126.00	144.10
Equipment	389.30	1,548.13
Leased Wire	841.10	1,281.42
TOTAL	$ 44,367.95	$ 56,925.84

III-A. MARKETING AUTHORITY	1941-42	1940-41
Salaries and Wages	$ 28,213.47	
Supplies and Materials	197.80	
Postage, Telephone, Telegrams and Express	730.74	
Travel Expense	10,837.15	
Printing and Binding	226.50	
Repairs and Alterations	39.05	
General Expense		
Equipment	180.37	
TOTAL	$ 40,425.08	

IV. CREDIT UNION		
Salary, Chief		$ 1,850.00
Salaries, Staff		3,677.50
Office Supplies		137.18
Postage, Telephone and Telegraph		188.77
Field Travel		2,453.09
Printing		120.82
Equipment		78.62
Transfer to General Fund	$ 2,500.00	
TOTAL	$ 2,500.00	$ 8,505.98
Refund from General Fund		4,252.99
		$ 4,252.99

V. DAIRY		
Salaries and Wages	$ 6,448.00	$ 3,915.00
Supplies and Materials	64.94	34.94
Postage, Telephone and Telegraph	124.81	99.88
Travel Expense	1,692.96	1,325.08
Printing and Binding	21.46	31.43
Equipment	346.47	45.35
Workmen's Compensation	172.50	
TOTAL	$ 8,871.14	$ 5,451.68

VI. ENTOMOLOGY		
Salaries and Wages	$ 14,696.33	$ 14,778.00
Supplies and Materials	124.09	149.72
Postage, Telephone, Telegraph and Express	219.89	188.87
Travel Expense	4,517.95	4,379.06
Printing and Binding	121.79	81.30
Subscriptions and Dues	78.89	102.65
Equipment	10.39	19.82
TOTAL	$ 19,769.33	$ 19,699.42

VII. SEED LABORATORY		
Salaries and Wages	$ 17,614.21	$ 16,427.20
Supplies and Materials	221.40	226.43
Postage, Telephone, Telegraph and Express	517.88	432.29
Travel Expense	3,313.63	3,229.79
Printing and Binding	351.09	296.69
Repairs and Alterations	23.72	15.23
Equipment		193.69
TOTAL	$ 22,041.93	$ 20,821.32

VIII. ANALYTICAL	1941-42	1940-41
Salaries and Wages	$ 47,188.49	$ 47,611.08
Supplies and Materials	3,846.40	2,932.93
Postage, Telephone, Telegraph and Express	790.06	651.36
Travel Expense	368.06	506.65
Printing and Binding	572.19	581.27
Repairs and Alterations	147.98	163.10
Laundry	5.45	4.81
Equipment	6,845.36	3,447.01
TOTAL	$ 59,763.99	$ 55,898.21
IX. CROP STATISTICS		
Salaries and Wages	$ 15,646.30	$ 14,910.75
Salaries and Wages, Extra	2,786.91	3,070.33
Supplies and Materials	114.62	124.63
Postage, Telephone, Telegraph and Express	281.76	186.91
Travel Expense	1,424.28	1,065.95
Printing and Binding	3,199.48	2,222.74
Repairs and Alterations	37.09	19.81
Subscriptions and Dues	10.00	15.50
Equipment	1,931.76	1,289.30
TOTAL	$ 25,432.20	$ 22,905.92
X. MUSEUM		
Salaries and Wages	$ 8,749.67	$ 8,378.00
Salaries and Wages, Extra	33.75	42.98
Supplies and Materials	385.48	339.63
Postage, Telephone, Telegraph and Express	137.60	78.67
Travel Expense	273.79	243.41
Printing and Binding	67.91	29.67
Subscriptions and Dues	39.03	34.09
Equipment	558.93	599.38
Repairs and Alterations		487.44
TOTAL	$ 10,246.16	$ 10,233.27
XI. SERUM		
Supplies and Materials	$ 347.72	$ 451.31
Postage, Telephone, Telegraph and Express	423.28	203.00
General Expense	55.55	30.49
Serum to be Resold	16,423.89	12,069.87
Diagnostic Laboratory	233.82	414.04
TOTAL	$ 17,484.26	$ 13,168.71
XII. VETERINARY		
Salaries and Wages	$ 33,737.24	$ 31,486.81
Salaries and Wages, Extra	8,978.16	8,728.02
Supplies and Materials	499.09	347.42
Postage, Telephone, Telegraph and Express	368.74	322.36
Travel Expense	23,590.28	20,908.40
Printing and Binding	136.85	78.72
Repairs and Alterations	21.35	18.70
General Expense	43.53	48.81
Equipment	139.32	93.56
Clinic on Mastitis		
TOTAL	$ 67,514.56	$ 62,032.80

XIII. TEST FARMS—ADMINISTRATION	1941-42	1940-41
Salaries and Wages	$ 4,920.00	$ 4,920.00
Supplies and Materials	113.31	173.29
Postage, Telephone, Telegraph and Express	307.05	249.98
Travel Expense	1,239.69	1,260.02
Printing and Binding	60.44	104.97
General Expense	50.00	35.95
Insurance and Bonding	364.50	2,010.95
TOTAL	$ 7,054.99	$ 8,755.16
BLACKLAND TEST FARM		
Salaries and Wages	$ 7,369.06	$ 6,343.84
Supplies and Materials	1,988.44	1,860.32
Postage, Telephone, Telegraph and Express	79.76	94.46
Travel Expense	238.74	324.60
Motor Vehicle Operation	582.18	448.44
Repairs and Alterations	317.55	290.72
General Expense	343.50	416.73
Equipment	1,947.33	1,609.22
Additions and Betterments	19.05	15.22
TOTAL	$ 12,885.61	$ 11,403.55
TOBACCO TEST FARM		
Salaries and Wages	$ 10,001.32	$ 8,386.95
Supplies and Materials	1,577.08	1,968.02
Postage, Telephone, Telegraph and Express	184.00	165.53
Travel Expense	16.20	278.00
Printing and Binding	28.17	14.52
Motor Vehicle Operation	216.23	83.62
Light, Water, Power	176.67	171.35
Repairs and Alterations	1,035.74	264.64
General Expense	337.67	1,015.78
Equipment	1,186.86	299.91
Additions and Betterments	149.37	891.00
Land		6,000.00
TOTAL	$ 14,909.31	$ 19,539.32
UPPER COASTAL PLAIN TEST FARM		
Salaries and Wages	$ 9,874.67	$ 9,349.97
Supplies and Materials	2,891.09	2,796.96
Postage, Telephone, Telegraph and Express	162.37	156.07
Travel Expense	262.10	278.38
Motor Vehicle Operation	1,004.18	789.27
Light, Power and Water	236.61	198.15
Repairs and Alterations	1,256.93	701.82
General Expense	473.21	497.58
Equipment	1,772.16	1,360.00
Additions and Betterments	727.22	488.90
TOTAL	$ 18,660.54	$ 16,617.10

MOUNTAIN TEST FARM	1941-42	1940-41
Salaries and Wages	$ 12,191.32	$ 12,085.79
Supplies and Materials	4,446.39	3,666.73
Postage, Telephone, Telegraph and Express	299.99	249.05
Travel Expense	474.70	449.93
Printing and Binding	25.00	24.87
Motor Vehicle Operation	523.39	446.35
Light, Water and Power	498.76	495.30
Repairs and Alterations	1,049.64	165.22
General Expense	586.65	336.03
Equipment	2,043.15	1,849.46
Additions and Betterments	2,241.57	627.54
Land	2,500.00	
TOTAL	$ 26,880.56	$ 20,396.27
COASTAL PLAIN TEST FARM		
Salaries and Wages	$ 14,122.17	$ 14,511.00
Supplies and Materials	4,119.35	3,724.46
Postage, Telephone, Telegraph and Express	339.92	504.28
Travel Expense	448.98	519.66
Printing and Binding	36.34	
Motor Vehicle Operation	978.46	948.01
Light, Power and Water	925.98	832.59
Repairs and Alterations	1,572.69	499.93
General Expense	139.68	98.00
Equipment	1,349.98	312.91
Additions and Betterments	481.43	714.00
TOTAL	$ 24,514.98	$ 22,664.84
PIEDMONT TEST FARM		
Salaries and Wages	$ 8,339.84	$ 7,898.01
Supplies and Materials	2,178.96	1,713.89
Postage, Telephone, Telegraph and Express	165.27	166.83
Travel Expense	449.82	499.82
Printing and Binding	14.08	16.86
Motor Vehicle Operation	359.30	325.17
Light, Power and Water	234.08	224.47
Repairs and Alterations	315.96	384.95
General Expense	242.92	398.55
Equipment	1,060.09	598.66
Additions and Betterments	203.11	436.41
TOTAL	$ 13,563.43	$ 12,663.62
TOTAL TEST FARMS	$118,469.42	$112,039.86

	1941-42	1940-41
XIV. MISCELLANEOUS		
Custodial	$ 6,480.00	$ 6,480.00
Farmers' Conventions	300.00	300.00
State Fair Exhibits	683.60	986.50
Excavation Indian Mounds		257.79
Renovation of Buildings	355.90	437.00
Contributions to Retirement System Funds	9,186.86	
Sheep Distribution	7,500.00	
TOTAL	$ 24,506.36	$ 8,461.29
XV. RESERVE		
XVI. RABIES		
Rabies	$ 817.32	$ 1,003.53
XVII. JAPANESE BEETLE WORK		
Salaries and Wages	$ 3,512.95	$ 4,898.50
Wages, Trap Tenders	2,917.75	3,203.50
Supplies and Materials	6,999.47	6,553.97
Travel Expense	286.45	561.80
TOTAL	$ 13,716.62	$ 15,217.77
XVIII. BLISTER RUST CONTROL		
Salaries and Wages	$ 3,990.76	$ 3,753.50
Supplies and Materials	826.60	1,182.60
TOTAL	$ 4,817.36	$ 4,936.10
XIX. SOIL TESTING		
Salaries and Wages	$ 13,755.22	$ 9,460.34
Supplies and Materials	1,003.97	1,902.38
Postage, Telephone, Telegraph and Express	414.27	416.57
Travel Expense	1,528.14	1,404.28
Printing and Binding	42.72	46.48
Equipment	731.37	1,151.57
Soil Containers	765.66	
TOTAL	$ 18,241.35	$ 14,381.62
TOTAL	$583,015.52	$509,132.16
Refund from General Fund		$ 4,252.99
TOTAL	$583,015.52	$513,385.15

N. C. STATE FAIR
FINANCIAL STATEMENT
STATEMENT OF DISBURSEMENTS
July 1, 1940-June 30, 1942

	1941-42	1940-41
Salaries and Wages	$ 19,345.60	$ 14,099.37
Supplies and Materials	2,123.83	401.03
Postage, Telephone, Telegraph and Express	682.27	602.61
Travel	170.85	118.31
Printing and Binding	2,691.21	1,698.37
Motor Vehicle Operation	343.17	236.19
Light, Power and Water	616.40	831.44
Repairs and Alterations	3,699.86	7,590.30
General Expense	47,964.38	44,166.40
Equipment	191.78	314.50
Additions and Betterments		1,905.76
Insurance and Bonding	45.00	125.00
TOTAL	$ 77,874.35	$ 72,089.28

N. C. STATE FAIR
STATEMENT OF RECEIPTS
July 1, 1940-June 30, 1942

	1941-42	1940-41
General Admission	$ 34,291.47	$ 30,616.93
Grandstand Admission	19,444.42	15,074.65
Auto Parking	6,911.75	3,388.50
Carnival Privileges	12,589.57	10,939.00
Sale of Advertising	1,610.00	1,462.50
Sale of Exhibit Space	2,084.20	2,946.10
Rent of Eating Booths	4,155.00	3,989.50
Concession Privileges	10,153.56	9,786.32
Entry Fees	1,484.26	1,244.00
Miscellaneous	635.51	474.16
Rental on Buildings	750.00	408.50
Interest on Bonds	770.00	770.00
TOTAL	$ 94,879.74	$ 81,100.16
Balance July 1, 1941		$46,456.63
Balance July 1, 1942		63,462.02

STATE WAREHOUSE SYSTEM
FINANCIAL STATEMENT
STATEMENT OF DISBURSEMENTS
July 1, 1940-June 30, 1942

	1941-42	1940-41
Salary, Superintendent	$ 3,750.00	$ 3,700.00
Salaries and Wages	16,425.17	16,586.00
Supplies and Materials	133.57	150.03
Postage, Telephone, Telegraph and Express	988.11	938.21
Travel Expense	2,985.30	2,561.89
Printing and Binding	6,560.11	4,870.00
Motor Vehicle Operation	171.82	
Repairs and Alterations	4.11	12.00
General Expense	130.00	356.66
Insurance and Bonding	331.25	371.25
Equipment	13.17	385.36
Repairs to Building		185.00
Contributions, Retirement System	530.43	
TOTAL	$ 32,023.04	$ 30,116.40

STATE WAREHOUSE SYSTEM
STATEMENT OF RECEIPTS
July 1, 1940-June 30, 1942

	1941-42	1940-41
Interest on Bonds	$ 14,628.75	$ 8,985.00
Interest on Loans	13,342.71	14,835.01
Leases	302.00	330.00
Sale Warehouse Supplies	7,376.32	5,921.80
Sale Loose Cotton		249.28
Miscellaneous	1.10	
TOTAL	$ 35,650.88	$ 30,321.09
Treasurer's Cash, Supervision Account	$ 48,682.22	$ 44,861.01
Treasurer's Cash, Principal Fund	56,851.09	35,562.48
Total Investments and Loans at June 30, 1942	$586,113.69	

WEIGHTS AND MEASURES
STATEMENT OF DISBURSEMENTS
July 1, 1940-June 30, 1942

	1941-42	1940-41
Salary, Superintendent	$ 3,000.00	$ 3,000.00
Salaries, Staff	10,518.49	6,918.83
Supplies and Materials	529.38	122.58
Postage, Telephone, Telegraph and Express	261.73	206.05
Travel Expense	8,425.28	5,914.31
Printing and Binding	92.84	50.95
Equipment	102.22	302.50
Office and Standard Testing Apparatus	470.83	
TOTAL	$ 23,400.77	$ 16,515.22

WEIGHTS AND MEASURES
STATEMENT OF RECEIPTS
July 1, 1940-June 30, 1942

	1941-42	1940-41
Public Weighmaster Licenses	$ 2,560.00	$ 2,555.00
Desk Presser Seals	552.50	362.50
Miscellaneous	30.00	2.99
TOTAL	$ 3,142.50	$ 2,920.49

BANG'S DISEASE
STATEMENT OF EXPENDITURES
July 1, 1940-June 30, 1942

	1941-42	1940-41
Indemnity Diseased Slaughtered Livestock	$ 17,893.53	$ 19,431.15

TUBERCULOSIS AND GLANDERS
July 1, 1940-June 30, 1942

	1941-42	1940-41
Indemnity Diseased Slaughtered Livestock	$ 50.00	$ 50.00

STATEMENT OF RECEIPTS

July 1, 1940-June 30, 1942

	1941-42	1940-41
Fertilizer	$298,543.66	$278,331.75
Cotton Seed Meal	24,207.67	32,063.45
Feed	112,212.60	97,146.80
Seed Licenses	21,903.00	20,174.00
Condimental Feed	1,960.00	1,320.00
Serum	18,601.15	14,508.13
Costs	2,206.00	1,449.89
Legumes		
Linseed Oil	1,895.61	2,635.31
Bleached Flour	12,500.00	14,140.00
Bottling Plants	2,020.00	2,195.00
Ice Cream	2,140.00	1,930.00
Insecticides	2,270.95	2,320.00
Chick Labels	203.55	118.07
Test Farms	43,933.36	39,931.66
Bakeries	1,575.00	1,940.00
Chicken Tests	20,828.25	17,113.33
Seed Tags	6,465.61	5,283.82
Seed Tests		
Inspection Entomology	2,170.80	2,420.90
Oleomargarine	2,250.00	2,100.00
Branding Cattle	1.50	
Rabies	1,094.03	1,503.02
Land Plaster Tags	2,108.28	2,342.77
Agriculture Lime Stamps	2,982.26	2,113.05
Fertilizer Registration	4,382.00	1,555.00
Dynanometer	53.00	55.40
Miscellaneous	88.55	180.69
Feed Registrations	3,646.00	3,456.00
Canned Dog Food Registrations	196.00	315.00
Dog Food Stamps	2,265.54	3,446.44
Soil Containers		17.46
Lime Registrations	430.00	305.00
Land Plaster Registration	50.00	15.00
Livestock Marketing Permits	750.00	
Low Grade Fertilizer Tags	2,003.96	
Fire Loss, Mountain Test Farm		1,571.06
TOTAL	$597,938.33	$553,998.00
ALLOTMENT DEPOSIT—		
REFUND FROM GENERAL FUND		$ 4,252.99
TOTAL	$597,938.33	$558,250.99

Balance July 1, 1941	$336,385.77
Balance July 1, 1942	351,308.58

TAX RATE ON FEEDING STUFF
TAGS AND STAMPS
25c Per Ton

Tax Tags Denomination of Tags	Cost Per Tag			Price Per 1,000 Tags
100 lb.	$ .0125	(1¼¢)	Packed 1,000 to Box	$12.50
75 lb.	.09375	(15/16¢)	Packed 1,000 to Box	9.38
50 lb.	.00625	(⅝¢)	Packed 1,000 to Box	6.25
25 lb.	.003125	(5/16¢)	Packed 1,000 to Box	3.13

Tax Stamps Denomination	Cost Per Stamp			Price Per 1,000 Stamps
100 lb.	$ .0125	(1¼¢)	Bound 1,000 to Book	$12.50
75 lb.	.09375	(15/16¢)	Bound 1,000 to Book	9.38
50 lb.	.00625	(⅝¢)	Bound 1,000 to Book	6.25
25 lb.	.003125	(5/16¢)	Bound 1,000 to Book	3.13
10 lb.	.00125	(⅛¢)	Bound 1,000 to Book	1.25
8⅓ lb.	.001041		Bound 960 to Book	1.00

Division of Chemistry

B. W. Kilgore

B. W. Kilgore

In the main the work of the Division of Chemistry of the Department covers the materials most used as plant food in growing field and horticultural crops, the feeds for domestic animals and poultry, human foods and drugs, insecticides and fungicides for combatting insect and fungus disease of plants, and the examination of a large number of materials of a general agricultural nature.

For the purpose of this report, the number of analyses of these various materials are classified under the following heads:

Fertilizers

Official Fertilizer	10,180
Fertilizers and Fertilizer Materials for farmers	273
Official Feeds	2,438
Miscellaneous Feeds	672
Cottonseed Meal	15
Official Limes and Land Plaster	23
Miscellaneous Limes and Marls	481
Fungicides and Insecticides	125
	14,207

The analyses of these various materials have shown that the goods put on the market of the State were generally of good quality and what they were claimed to be.

Detailed reports of the analyses were made reasonably promptly to the persons interested in the analyses.

In the case of fertilizers, in addition to the usual analyses, determinations were made of magnesium, calcium and sulphur. Around 4,700 determinations were made for magnesium, 2,200 for calcium and 775 for sulphur. These additional determinations of materials in fertilizers give helpful information to the farmer who is carefully studying his soil and the crops he grows for the effect of the different kinds of plant foods.

Commercial Feeds

During the biennium the Feed Laboratory made analyses of 3,110 samples. Of this number 2,438 were official samples collected by our inspectors. On each of these official samples, in addition to the chemical analysis, a check was made of the ingredients present. Analytical results were reported promptly to the interested parties.

Inspector taking sample of fertilizer to be sent to the laboratory for analysis.

Owing to abnormal conditions and a scarcity of certain ingredients it has been found that deviations from the guarantee have increased somewhat, but upon the whole the feeds offered for sale have been of good quality.

INSECTICIDES AND FUNGICIDES

There has been a sizable increase in interest and in the use of insecticides and fungicides for combatting insect and fungus diseases of field and horticultural crops. These products are

Inspector takes sample of feed from farmer's truck to be sent to the laboratory for analysis.

being used more intelligently and more effectively with the experience gained in their use and the results obtained from them. The dependence that is put in these products in growing crops makes it necessary to see that only proper materials are put on the market. It has been found that the products in the main are what are claimed for them.

FOODS

In comparison with the work previously done under the Food, Drug and Cosmetic Act, that done during the past biennium was characterized by a material increase in sanitary inspection and regulatory activity, the most significant being constant vigilance of food producing plants to keep them clean and the output of their products sanitary. Nine bakeries, five ice cream plants, two large pickle plants, three candy factories and four places where sausage and other ground meats were made were closed due to insanitary conditions and were permitted to reopen only when cleaned, inspected and approved by either a State food inspector or by local city health authorities. In a few instances plants failed to meet the sanitary requirements of the law and remained closed. In cases of the pickle plants, as interstate shipments were involved, the Federal Food and Drug Administration coöperated with us in inspecting both the plants and the stock on hand. The plants were closed until cleaned and put in acceptable sanitary condition.

Much of our inspection work has been in coöperation with the Federal Food and Drug Administration and with city and county health authorities.

Comprehensive score cards have been adopted and are now in use in inspecting and scoring bakeries, bottling plants and ice cream plants. In making an inspection and grading a plant, the inspector calls attention to any defects in the plant or to the insanitary manner in which it is operated and makes suggestions for the correction of such conditions.

Seasonal inspections have been made of canneries packing vegetables, fruits, fish and fish roe, and candy factories. The importance, not only of sanitation, but also of the packing of canned goods so they will come up to U. S. Standard Grade, has been emphasized. Attention also has been called to proper labeling in line with the requirements of both the State and Federal laws and regulations. Inspections have also included flour mills, grist mills, grocery stores and many other places manufacturing and handling food products.

Total number of inspections made 6,546

Filth and Other Forms of Contamination Including Insect Infestation

Filth and various other forms of contamination, some of which resulted from insanitary manufacturing or storage conditions, accounted for the seizure of:

17 cans of herring roe.
2 cars of corn meal.
100 pounds of candy.
465 cases of canned field peas.
500 pounds of miscellaneous canned goods and cereals.
300 pounds of evaporated apples.
120 cans of assorted vegetables, meats and fruits.
5,554 pounds of flour.
45 pounds of meal.
40 barrels of relish.
28 cases of relish.
12 pounds of raisins.

ADULTERATION AND MISBRANDING

The following products were seized because they were either adulterated, misbranded, improperly labeled or not labeled in any form:

72 gallons of vinegar.
19 jars of mayonnaise.
62 pounds of paprika.
19 pounds of Chili Powder.
26 gallons of cherries.
23 gallons of horse radish.
137 pounds of coffee.
157 jars of molasses.
20 gallons of molasses.
34 bottles of lemon flavor.
3,156 packages of candy.
100 packages of cake.
7 gallons saur kraut.
1,837 cans of syrup.
36 cartons of vanilla extract.
36 cartons of lemon extract.

Foods Seized Due to Decomposition and Spoilage

As a result of decomposition in whole or in part seizures were made of the following lots:

264 cases of oysters.
9 cans of huckleberries.
2 cans of strawberries.
Liver mush, sausage and other ground meats.
20 gallons ice cream mix.
2,500 pounds of assorted groceries.
2 pounds of spiced beans.
500 pounds of miscellaneous canned goods.
79 crates of lettuce.
11 cans of corn.
42 packages of wafers.
288 pounds of evaporated apples.
1,924 pounds of flour.
792 cartons of cakes and cereals.
25 pounds of cake.
75 pounds of chocolate.
100 pounds of cookies.
25 pounds of stick candy.

As these goods were unfit for human consumption, they were either destroyed or denatured and permitted to be sold or otherwise disposed of for animal feed.

FLOOD AND FIRE DAMAGED GOODS

Large quantities of groceries were damaged by flood and by fire, and by water and chemicals incident to the fire.

During August, 1940, large stocks of groceries were so damaged by flood waters as to render them unfit for human consumption. As some of these goods involved interstate shipments, Federal Food and Drug inspectors coöperated with our inspectors in the inspection and destruction of these damaged food products. Practically all of these groceries were so badly damaged that they were a total loss for human consumption. Among these were the following:

Elkin, N. C.

1,820 cans of syrup.
61 pounds of shortening.
14 gallons of syrup.
12 baskets of assorted bottles of flavors.
53 bottles of castor oil.
33 bottles of assorted flavoring extract.
10 quarts of cucumber pickles.
73 jars of apple butter.
46 quarts of vinegar.

North Wilkesboro, N. C.

17 cases of baking powder.
386 packages of tea.
958 packages of baking powder.
144 pounds of lard.
14,000 pounds of dry salt meat.
26,304 pounds of flour.

Marshall, N. C.

1,080 pounds of salt meat.
558 pounds of lard.
3,024 pounds of sugar.
395 pounds of peanut butter.
75 pounds of English walnuts.
54 pounds of candy.
161 boxes of assorted candies.
312 packages of cocoa.
255 pounds of mustard.
25 packages of raisins.
2,264 pounds of bicarbonate of soda.
130 bottles of clives.
280 bottles of cherries.
700 jars of mayonnaise.
24 packages of marshmallows.
6 packages of vanilla wafers.
140 cans (1 lb. each) chocolate syrup.
20 pounds of smoke salt.

Dillsboro, N. C.

21 pounds smoke salt.
39 packages of cereal.
119 pounds of shortening.
4 packages of macaroni.
2 packages of cocoanut.
4 quarts of salad dressing.
11 pounds of coffee.
146 packages of black pepper.
5 pounds of oleomargarine.
76 pounds of flour.
10 pounds of salt meat.
19 pounds of cocoa.
270 packages of sausage seasoning.
7 pounds of peanut butter.
3 packages of gelatin.
1 gallon of syrup.

Chandler, N. C.

100 pounds of corn meal.
144 pounds of flour.
75 pounds of sugar.
5 cartons of crackers.
69 pounds of side meat.
72 pounds of shortening.
10 (5-lb. cans) syrup.
10 pounds of honey.
5 bottles of vinegar.
30 lbs. of cheese.
200 pounds of candy.
200 sandwiches.
480 cream mint puffs.
4 gallons of mayonnaise.
10 gallons of mustard.
864 bags of salted peanuts.
231 boxes of assorted candies.

Canton, N. C.

1,255 pounds of salt.

Waynesville, N. C.

184 pounds of lard.
50 pounds of sugar.
14 pounds of baking powder.
19 pounds of coffee.
75 pounds of beans.
24 pounds of cocoa.
65 bottles of assorted soft drinks.
1,015 pounds of salt.

Hazelwood, N. C.

9 pounds of oat meal.
72 cartons of baking soda.
8 pounds of cocoa.
36 pounds of coffee.
24 bottles of tomato catsup.
35 jugs of vanilla extract.
250 pounds of salt.
10 pounds of bulk candy.

Cullowhee, N. C.

48 pounds of flour.
1 quart of soft drink syrup.
2 pints of cherry concentrate.
3 quarts of root beer.
7 quarts of salad dressing.

Tuckaseigee, N. C.

This town was practically inundated and all groceries were so badly damaged by water and covered with mud that it was impossible to make a record of the good destroyed. All groceries were either dumped into creek or burned.

Kinston, N. C.

46 cans of baking powder.
3 cans (15 pounds) of syrup.
105 pounds of sugar.
100 pounds of rice.
48 pounds of flour.
480 cartons of baking soda.

Among groceries damaged by fire, and by water and chemicals incident to the fire, and being unfit for human food or animal feed, the following were destroyed:

Charlotte, N. C.

Two truck loads, approximately 2,000 pounds, consisting of flour, canned meats, vegetables, soups, milk and other groceries.
From a burned store:
253 cans of meat.
48 cans of soup.
27 bottles of condiments.
172 packages of baby food.
127 cans of assorted fruits.
29 cans of salmon.
113 cans of vegetables.
1,356 pounds of flour.
270 packages of cereals.
35 loaves of bread.
78 bakery cakes.
95 pounds of salt meat.
20 pounds of sausage.
76 packages of spaghetti and macaroni.
97 jars of mayonnaise and salad dressing.
15 stalks of celery.
36 heads of lettuce.
30 pounds of green beans.
10 pounds of squash.

Sparta, N. C.

One truck load of canned goods consisting of corn, kraut, tomato juice, carrots, soup and bottled catsup.

LABELING

A total of 7,965 labels on packages of food were examined and of that number 4,371 labels were incorrect or carried insufficient or misleading information. A label should tell the purchaser what he is getting, and while many labels require additional information, every label should show the name of the article, the net contents of the package, and the name and address of the manufacturer or jobber responsible for the sale of the product.

When packages of foods were found that either carried no labels, or insufficient or misleading information, the inspectors gave the necessary instructions for proper labeling and if these instructions were carried out the sale of the goods was permitted to be continued. In some instances permission was given to return the goods to the manufacturer for proper labeling. But in cases where misbranding and adulteration could not be corrected by any form of labeling, the goods were either destroyed or denatured and permitted to be sold or otherwise disposed of for purposes other than for human consumption.

ANALYSES

A total of 1,550 samples have been analyzed or otherwise examined. The purpose of these analyses and examinations was to determine:

(1) *Filth:* Filth in samples was due to carelessness in manufacturing or carelessness in handling in storage or by grocers. Such samples showed the presence of insects, rat excreta and hairs, worms and other miscellaneous foreign substances.

(2) *Fraud by Adulteration and Misbranding:* These samples were those labeled and represented to conform to standard requirements of the Food, Drug and Cosmetic Act, and regulations and standards thereunder, but failed to meet such requirements.

(3) *Spray Residue:* These samples consisted of vegetables and fruits. In an effort to exterminate the Japanese beetle, areas where it was found were heavily sprayed. Many citizens responding to the request for Victory Gardens planted vegetables in some of these sprayed lots, and in a few instances arsenic above the tolerance allowed under the Federal regulations was found in some fresh vegetables from lots recently sprayed, but in most of these samples the arsenic present was well below the permitted tolerance. Samples of apples were examined for spray residue, but in no instance was arsenic found above the allowed tolerance.

(4) *Foods Canned in the State:* To assist canners in the State in putting up U. S. Standard Grade products, a number of samples have been examined and when samples were found that failed to meet such requirements, the canners have been advised wherein their products were not up to U. S. Standard Grade and suggestions were made as to how to raise the standard of their goods.

(5) *Miscellaneous and Unofficial Samples:* These samples consisted of a variety, such as human foods, animal and poultry feeds, beverages, and viscera of animals where there was indication or suspicion of poisons, water, alcoholic beverages, and other substances for chemical analyses or identification, and soils and water containing substances supposed to be harmful to plants.

On analyses for poisons and deleterious substances, of thirty-one food samples, eleven were positive; sixty-seven feed samples, eight were positive; twenty-nine animal viscera, ten were positive; twelve beverages, eight were positive; five miscellaneous samples, four were positive. Poisons appeared in approximately 28% of these samples. Circumstances indicated their presence to be due largely to accident or carelessness, though malice was not entirely absent.

Other miscellaneous samples consisted of foods and beverages in which adulteration was suspected; water to determine suitability for boiler use, causes of corrosiveness or general mineral content; and a variety of materials for identification.

DRUGS

Comparatively little work has been done toward enforcing that part of the Food, Drug and Cosmetic Act relating to drugs. This has been due to (1) shortage of funds and (2) the induction of our pharmaceutical chemist into the army and the appointment of the senior chemist handling this feature of the laboratory work to a Federal position. So far we have not been able to secure the services of chemists prepared to take over this work.

COLLABORATION WITH OTHER DEPARTMENTS

Analytical work done for other State and Station Departments not included in other reports from this Department is summarized as follows:

(1) *Carbohydrate and Nitrogen Determinations:* In coöperation with the Department of Horticulture of State College, analytical determinations were made of approximately two hundred samples of plant material relating to the effect of certain soil constituents and conditions respecting the continuous growth of peach trees on old plots of long standing.

(2) *Coöperative Work Relative to the Production of Beef Cattle in North Carolina:* Pursuant to the interest in this State a study of the role of forest grazing in beef cattle production, an understanding for coöperative work was entered into by the Department of Agriculture, the North Carolina and Georgia Agricultural Experiment Stations and the Forest Service and the Bureaus of Animal and Plant Industries, United States Department of Agriculture, in which were utilized funds provided by Federal appropriation and the lands, facilities and personnel of the coöperating agencies.

This work included surveys of beef cattle production, methods of feeding, the utilization of native forage, biological and chemical studies of this forage and of beef cattle feeding on it. In these studies Department workers made feed and mineral analyses of native wild grasses and forage plants and of blood specimens from cattle.

The work was concluded in the latter part of 1941, copies of the results being submitted to the State Experiment Station and Federal Bureaus for incorporation in their records and also included in the Department records. The work on the part of the Department on feeds was done by L. M. Nixon and on blood by E. W. Constable.

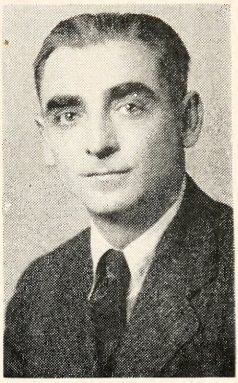
IMPROVEMENT IN LABORATORY FACILITIES

Changing conditions, deterioration and new demands periodically call for renovation and rebuilding of laboratories. Two, —Nitrogen and Potash,—were rebuilt during the current biennium.

Space and facilities for the nitrogen laboratory were increased approximately thirty per cent. Gas burning equipment was replaced by electrically heated types of most efficient and up-to-date design thus eliminating combustion fumes and much undesirable heat. Lighting, ventilation, and working conditions were greatly improved. The potash laboratory was renovated, facilities added and working conditions improved. In design, efficiency and working conditions these laboratories compare well with the best of their kind.

Credit Union Division

D. R. Graham



D. R. Graham

During the two-year period ending June 30, 1942, credit unions operating under the supervision of this Department have shown a marked increase in both numbers and assets. Due to the Federal restrictions, however, no increase whatever has been shown in loans outstanding, the increase of approximately $600,000 in assets being reflected in cash on hand and in banks and purchases of government bonds.

Under existing Federal regulations installment loans can not be made for a period longer than twelve months. This, together with the rapidly decreasing supply of durable goods, has considerably lessened the demand for short-term credit.

The appeal of the Government for the purchase of War Bonds and Stamps has been met with enthusiasm by our credit unions. Several of them have qualified as issuing agents for War Bonds, and a number of them have invested all or part of their cash reserve in these bonds.

During the period 38 credit unions were organized and 13 charters were cancelled. Five of the cancellations resulted from charters being issued to groups which never began operations. The credit unions organized were distributed as follows: business, professional and industrial groups, 17; State and Government employees, 5; rural community, 1 white, 7 negro; urban community, 3 white, 2 negro; teachers, 3 negro.

All credit unions have been examined at least twice during the biennium and the few irregularities found have been corrected.

A considerable number of credit union loans have been frozen by reason of the fact that the borrowers have entered military service. It is not anticipated, however, that the freezing of these loans will seriously handicap credit unions, and it is the accepted policy to make no effort to collect loans from men in the service. Some credit unions have gone so far as to waive interest on these loans.

During the biennium our credit unions made 57,611 loans aggregating $5,158,986.95. A major portion of these loans were made during the first 18 months of the period and since January 1, 1942 loans have fallen off sharply.

The condensed statement below shows that 27,094 credit union members have accumulated resources of $2,105,582.29. These savings were accumulated largely because of the fact that credit unions provide an easy and convenient place where a

member may save small amounts of money which he would not normally deposit in a bank. It is safe to assume that without credit unions practically none of this money would have been saved.

We anticipate little growth in credit unions for the duration of the war as credit union officials are going all out in their effort to promote the sale of War Bonds and Stamps to their membership.

	June 30, 1940	June 30, 1942
Active Credit Unions	125	150
Total Members	22,466	27,094
Total Assets	$ 1,593,380.89	$ 2,105,582.29
Number of Loans Made Since Organization	89,463	147,074
Amount of Loans Made Since Organization	$10,704,704.67	$15,863,691.62

CONDENSED STATEMENT OF CREDIT UNIONS
AS AT JUNE 30, 1942

RESOURCES

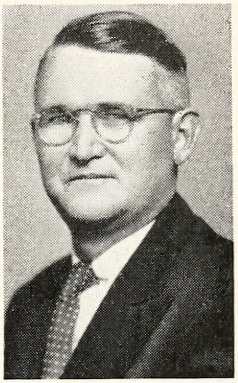
Loans to Members	$ 1,385,473.53
Cash on Hand and in Banks	423,237.87
Other Assets	296,870.89
	$ 2,105,582.29

LIABILITIES

Shares	$ 1,618,476.58
Deposits	270,315.54
Other Liabilities	45,945.49
Reserve (Guaranty Fund)	100,510.40
Surplus and Undivided Profits	70,334.28
	$ 2,105,582.29

Dairy Division

C. W. Pegram



C. W. Pegram

The past biennial period was the most active and successful one since the organization of the Dairy Division. During this time the dairy industry has made outstanding growth and development. Milk purchases, as reported by plants, increased approximately 100 per cent from 1939 to 1941. The 1941 gross farm income from dairy products, as estimated by the Federal-State Crop Reporting Service, was an all-time high totaling $39,572,000, representing a cash income of $14,430,000.

The enforcement of the Babcock test law has had its effect on the growth of the industry. Thirty thousand check tests were made in the 1,642 investigations at 90 plants and stations during this period covering the supervision of 140 licensed testers, weighers, and samplers. This is an increase of 5,177 checks over the past biennial with 167 more investigations and an increase of 25 plants and stations. Inspections consist of determining the accuracy of the work done by licensed testers, weighers, samplers, and the equipment used. The greatest factors causing inaccurate tests are carelessness and unreliable methods in sampling and testing. Scales and balances were checked for accuracy periodically in coöperation with the Division of Weights and Measures.

The most effective system of securing results involves maintenance of an active year-round program at all plants and receiving stations. This supervision is very necessary due to the fact that plant personnels are constantly making changes which requires the training of new testers. In addition to regular test investigations, special check-ups are made for dairymen requesting same.

Testers are not issued licenses until they have been examined for the purposes of determining their ability to make practical and reliable tests of milk and cream.

The Dairy Division protects the dairy farmer and honest manufacturer against inaccurate butterfat tests and the careless weighing of milk and cream. This work is carried on by the continuous supervision of weighers, samplers, and testers and 50 cream routemen at 90 buying plants and stations. All testing and weighing equipment is checked at periodic intervals for accuracy. Approximately 1,700 plant investigations are made annually with 30,000 check tests being made. The system of supervision is similar to that carried on in leading dairy states.

A modern milk receiving station. New markets are afforded milk producers by the location of stations of this type.

Definite regulations regarding the weighing, sampling, and testing of milk and cream have been established.

This work is very important to the industry, and it is estimated that if 0.2 per cent error was made on all tests through careless sampling and testing, this would cause an annual loss of approximately $100,000.00 to the dairymen and cream producers of the state.

The purpose of this program is to require that accurate work be done and then to establish confidence between buyer and seller which is important as a basis on which to build the dairy industry in North Carolina.

The Division is also coöperating with the Federal Crop Reporting Service in securing semi-annual reports relating to the production of milk and dairy products within the state. This information supplies data relative to the growth and trend of production in dairying.

The Milk Audit Law is also supervised by this division. Reports of purchases and sales of milk from 66 plants are received and verified each month. This service has been of great value in establishing confidence and stability in the fast growing industry.

BABCOCK TEST LAW

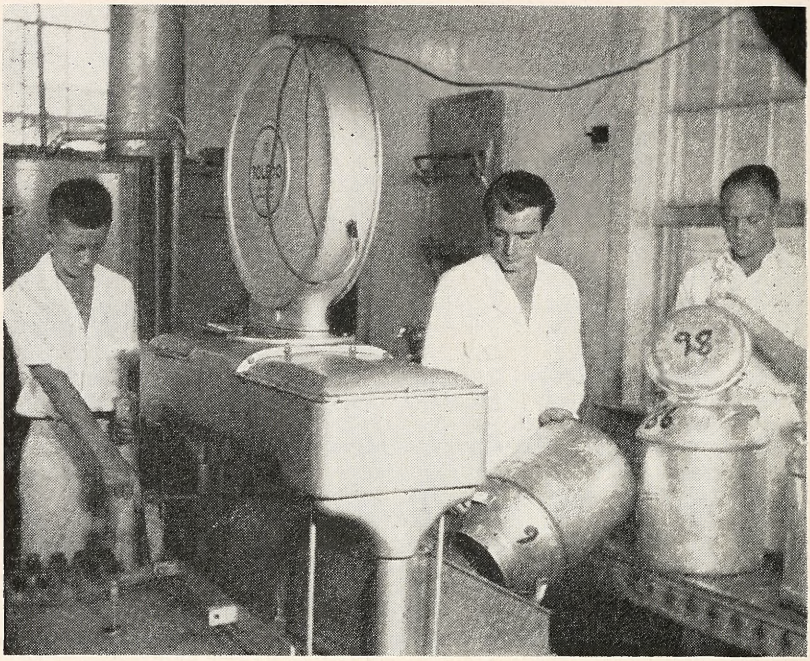
(Chapter 550 Public Laws 1933)

Buying plants and stations supervised		90
Plant investigations		1,642
Butterfat check tests	20,498	
Butterfat tests supervised	5,463	
Sample tests	4,108	30,069
Testers, Weighers and Samplers licensed (annually)		140
Testers licenses suspended		2
Cream routemen's reports checked		22
Tests found incorrect (adjustments made)		650
Test notices mailed		5,307
Cream balances checked		14
Cream balances condemned		2
Testing equipment condemned		4
Oleomargarine inspections		522
Wholesale Oleomargarine licenses issued		57
Bottles calibrated		300
Meetings attended in connection with Dairy Marketing and Milk Auditing Law		43
Visits made to dairy farms		46
Visits made to dairy plants re-statistics		18
Milk and cream scales checked (In cooperation with Bureau of Weights and Measures)		190
Scales condemned for repairs		38
Weights confiscated		7
Special test investigations		75
Testers trained		50
Examinations given testers		50
Reports received and verified under Milk Auditing Law		568
Auditors plant visits		113
Plant audits		12

MILK AUDIT LAW

(Chapter 162 Public Laws of N. C. 1940)

This law was enacted by the 1940 Legislature, and has made it possible to save thousands of dollars for dairymen through the elimination of certain buying plans and trade practices. Monthly reports of milk purchases and sales are required of milk distributors buying on classification plan, or where plants are buying inspected and uninspected milk. While unusual market demands for milk have prevailed during the operation of this law, it is significant that surplus milk has been reduced from approximately ten per cent to practically nothing. In most cases distributors have coöperated in this work, and the results should make for stabilization of the industry in the state.



Milk receiving—weighing and sampling. Accurate weighing and representative samples are important.

PURCHASES OF GRADE A MILK FROM PRODUCERS AS REPORTED BY MILK DISTRIBUTORS

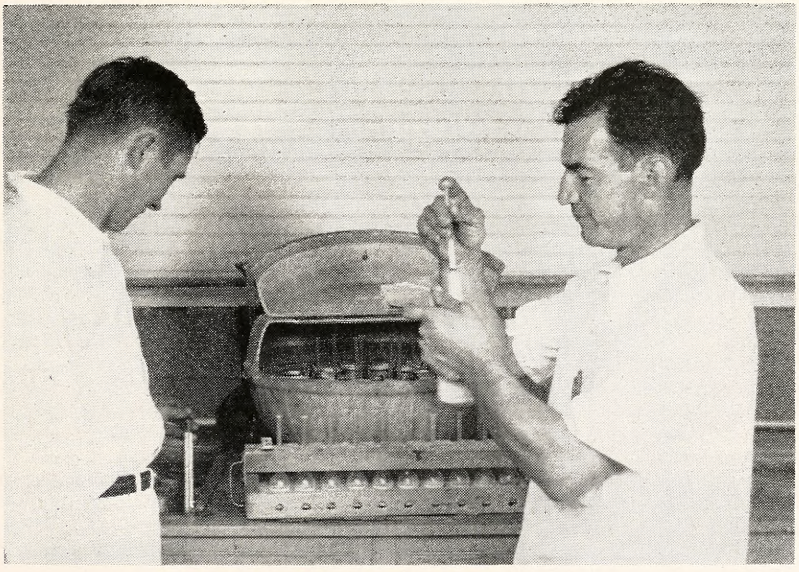
1941	Total Purchases	Class 1	%	Spec. Price Army Camps, Etc.	%	Surplus or Low Price Milk	%
June	8,911,478	7,569,985	84.95	502,050	5.63	839,443	9.42
July	9,203,721	7,846,076	85.25	393,663	4.33	958,982	10.42
August	10,033,040	8,726,521	86.98	500,806	4.99	805,713	8.03
September	9,270,392	8,482,116	91.50	545,860	5.89	242,416	2.61
October	8,629,928	7,874,190	91.24	614,072	7.12	141,666	1.64
November	7,968,268	7,378,150	92.59	349,286	4.38	240,832	3.03
December	8,556,820	7,899,061	92.31	486,939	5.69	170,820	2.00
1942							
January	8,534,982	7,969,215	93.37	444,750	5.21	121,017	1.42
February	8,546,994	7,955,953	93.08	515,289	6.03	75,752	.89
March	9,762,352	9,183,780	94.07	544,630	5.58	33,942	.35
April	10,140,344	9,653,058	95.19	463,302	4.57	23,984	.24
May	10,738,500	10,359,948	96.47	373,615	3.48	4,937	.05

DAIRY STATISTICS FOR NORTH CAROLINA
(Chapter 327—Public Laws N. C. 1939)

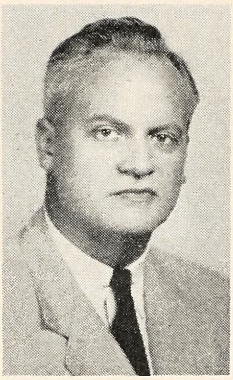
Each year the Dairy Division in coöperation with the Federal-State Crop Reporting Service obtains valuable statistics showing the development of the dairy industry in North Carolina. All milk plants, ice cream plants and creameries report the amount of milk purchased and the dairy products manufactured during the past calendar year.

This information is of special value during the present emergency when much data is necessary in planning the growth of the dairy industry of the state. Listed below are the figures for the years 1939-1941:

	1939	1940	1941
Whole Milk purchased as reported by plants—pounds	100,955,354	145,883,458	205,047,914
Whole Milk sold for fluid consumption—pounds	61,307,000	75,942,000	109,975,904
Cream sold for fluid consumption—gallons	290,000	241,000	283,276
Creamery butter made—pounds	2,366,000	2,357,000	2,315,603
Ice Cream manufactured by plants—gallons	3,477,000	3,862,000	5,908,578
Ice Cream manufactured by counter freezers—gallons	173,000	339,000	385,023
Total Ice Cream manufactured—gallons	3,650,000	4,201,000	6,293,601
Total Sherbets manufactured—gallons	504,000	599,000	134,995
Total Ice Milk manufactured—gallons		406,000	812,779
Ice Cream mix sold—gallons	285,000	283,000	583,755
Cottage, Pot & Bakers Cheese manufactured—pounds	211,000	301,000	298,398
Unsweetened skimmed milk manufactured—pounds	928,000		3,770,683



Testing milk for butterfat. The testing of milk is of a technical nature and for accurate results it is necessary that every detail be followed carefully.



C. H. Brannon

Division of Entomology

C. H. Brannon

The Division of Entomology is charged with the responsibility of administering the State plant pest regulations and laws. It also has charge of enforcement of the North Carolina Bee Disease Law. This Division coöperates with the U. S. Bureau of Entomology and Plant Quarantine in White Pine Blister Rust control, Phony Peach Disease eradication, Japanese Beetle control, scouting for European Corn Borer infestation, Potato Tuber Moth scouting, White Fringe Beetle scouting and other coöperative projects.

The valuable work of insect identification, filing of insect records and care of the vast collection is also an important phase of our activities.

Nursery Inspection

The largest phase of the work of the Division of Entomology is the annual inspection of all North Carolina Nurseries. This work is carefully carried out by J. A. Harris and D. L. Wray and occupies most of their time during July, August and part of September of each year. The Nurseries of the State give us hearty coöperation. This inspection service is recognized as one of the best in the nation and the North Carolina nursery certificate is accepted by the Federal Government and all states. Two hundred and twelve nursery certificates were issued for the 1940-41 season and 217 nursery certificates were issued in 1941-42.

Nursery certificates are issued if the nursery satisfactorily passes inspection and pays the required fee. The nursery inspection fees are as follows:

3 acres or less	$ 5.00
4 to 10 acres	7.50
11 to 15 acres	10.00
16 acres	12.50
Each additional acre	.10

Nursery Dealer Certificate

Nursery stock dealers are required to pay an annual fee of $10. This applies to stores or individuals. Forty-nine dealer certificates were issued in 1940-41 and fifty-three dealer certificates were issued in 1941-42.

PLANT SHIPPING PERMIT

Those who collect and ship native plants including boxwood are required to pay an annual fee of $10. Seventeen plant shipping permits were issued in 1940-41 and sixteen plant shipping permits were issued in 1941-42.

BOND REQUIREMENT

A bond of $1,000 is required of all who promise (orally or written) later attention to nursery stock sold in North Carolina.

APIARY INSPECTION

The following report is submitted by the State Apiary Inspector, P. G. Craddock, who is engaged in conducting the splendid State bee disease control program and carefully enforcing the State bee disease laws and regulations which give protection to the bee-keepers of the State:

"Four years ago all of the State east of highway U. S. No. 1 was designated as a clean-up area in which intensive work should be done in an attempt to eradicate American foulbrood from this area. The results of this work have been very gratifying and American foulbrood, the most serious disease affecting bees, has been reduced in this area to the extent that only an occasional infected colony is found and the economic loss from it is negligible. Since many bees are moved back and forth from the eastern to the western part of the state and some brought in from other states constant inspecting and re-checking of bees in this area will be necessary in order to locate and clean up any new outbreaks of disease before it has a chance to spread.

"Definite progress is being made in controlling disease in the Piedmont area where for the most part it is found around the cities and towns and occasionally in rural communities. Much of the inspection in the Piedmont area has been done in coöperation with county farm agents and vocational teachers. Local leaders in beekeeping have given excellent coöperation on the disease control program and in many cases have given much of this time in helping to locate and clean up outbreaks of disease.

"Additional help will be necessary before adequate inspection can be provided in the mountain counties. A large percentage of the bees in this area are in box hives which necessitates an educational program emphasizing the need of getting most of the bees into movable frame hives before effective inspection and disease control can be achieved.

"From July 1, 1940 to June 30, 1941—11,958 colonies of bees were inspected and 235 colonies or 1.97% found infected with American foulbrood. Eleven certificates for queen rearing were issued during the year.

"From July 1, 1941 to June 30, 1942—13,174 colonies of bees were inspected and 57 colonies or .004% were infected with

A North Carolina bee yard.

American foulbrood. Ten certificates for queen rearing were granted.

"Several apiaries were inspected for northern beekeepers who keep bees in North Carolina. These apiaries were free from disease.

"European foulbrood, a disease which affects primarily the black race of bees, is widely scattered throughout the state. No regulations have been put into effect on European foulbrood but much time has been spent in helping beekeepers to control this disease. There are several minor diseases affecting bees which have received attention when beekeepers have requested help in control work.

"The shortage of sugar and higher prices for honey and beeswax has resulted in a large number of new beekeepers in the State. This and the loss of Mr. C. L. Sams, Extension Bee Specialist, has resulted in a great increase in correspondence on beekeeping matters from this office."

INSECT IDENTIFICATION

Insect identification and classification has always been an important part of this Division's work. Dr. C. S. Brimley, who since 1919 has had charge of this highly technical field is recognized as one of the foremost authorities in the world. In May 1942 the Division published Dr. Brimley's "Supplement to the Insects of North Carolina" which brings the published list of North Carolina insects up to date. The original list, in book form, was published by the Division in 1938. North Carolina

is one of the few states to issue a complete insect list and we are probably the only state which has brought its annotated list so up to date.

BLISTER RUST CONTROL

The Blister Rust disease has been found in North Carolina. Until recently the program was one of prevention. The disease spreads from currant and gooseberry bushes to white pine. Currants and gooseberries are eradicated in close proximity to white pines in order to prevent the spread of blister rust. The disease cannot spread from pine to pine.

Five thousand dollars has been allocated each year of the biennium by the Department to match in part expenditure of Federal funds.

The State maintains a quarantine which allows no movement of currant or gooseberries into the quarantined area (all that part of the state including and west of Surry, Wilkes, Caldwell, Burke, and Rutherford counties). No currants or gooseberries are allowed to move anywhere in the state except by special Federal-State permit.

The auditor's report will show the disbursement of the state fund for this work.

RIBES ERADICATION

Acres work initial	6,384
Acres worked reëradication	52,127
TOTAL ACRES WORKED	58,511
Ribes pulled wild	610,389
Ribes pulled cultivated	11,178
TOTAL RIBES PULLED	621,567
TOTAL MAN HOURS	61,789

PREERADICATION SURVEY

Number of counties	7
Acres W. P. over 50 trees per acre	54,660
Acres W. P. under 50 trees per acre	15,209
Acres W. P. worth protecting	69,433
Control acreage (W. P. plus Proct. Z.)	156,865
Man hours	46,731

CHECKING

Acres checked advance	85.0
Acres checked regular	6.5
Acres checked post	1,696.0
TOTAL ACRES CHECKED	1,787.5
Man hours	1,979

NURSERY SANITATION

Number nurseries worked	3
Number W. P. in nurseries	4,125
Number acres worked	40
Number ribes destroyed wild	104
Man hours supervision	8
Man hours labor	329

Inspecting a beetle trap.

Those who are interested in further details of this program can refer to the annual reports of Mr. H. B. Teague, the Federal Superintendent in charge of the program whose headquarters are in Asheville.

JAPANESE BEETLE CONTROL

The State Japanese Beetle quarantine is maintained in coöperation with the U. S. Bureau of Entomology and Plant Quarantine. Mr. C. H. Hill who formerly was in charge of this work was inducted into the Army in February 1942. Mr. J. B. Riley assumed Mr. Hill's duties on a part time schedule on March 1, 1942.

The Japanese Beetle Quarantined area includes—townships of Broadbay, Middle Fork, Old Town, South Fork and Winston-Salem in Forsyth County; townships of Morehead and Gilmer in Guilford County; township of Salisbury in Rowan County; townships of Asheville and Limestone in Buncombe County, and township of Charlotte in Mecklenburg County.

The Japanese Beetle Quarantine regulation reads in part as follows:

No nursery, ornamental, or greenhouse stock, or other plants, plant roots or sand, soil, peat, compost or manure, should be transported in any manner from the said infected areas to or through any other part of the State of North Carolina, unless a special permit shall have been issued therefor by the North Carolina Department of Agriculture.

Nursery and greenhouse operators and dealers, after proper inspection, are issued, without charge, special Japanese Beetle certificates, one of which must accompany each shipment of quarantined material out of the quarantined area. Approximately 3,000 Japanese Beetle certificates are issued each year.

Trapping

Japanese beetle traps are placed in certain areas during the summer to determine the spread of the beetle.

During June and July 1941 Japanese beetle traps were placed as follows: Asheville 900; Burlington 300; Charlotte 600; Durham 600; Elizabeth City 300; Goldsboro 200; Greensboro 900; Henderson 40; High Point 600; Oxford 12; Lexington 200; Murfreesboro 5; Raleigh 600; Rocky Mount 300; Salisbury 300; Spencer 250; East Spencer 250; Sanford 100; Weldon 100; Wilson 200; Wilmington 600; Winston-Salem 1200.

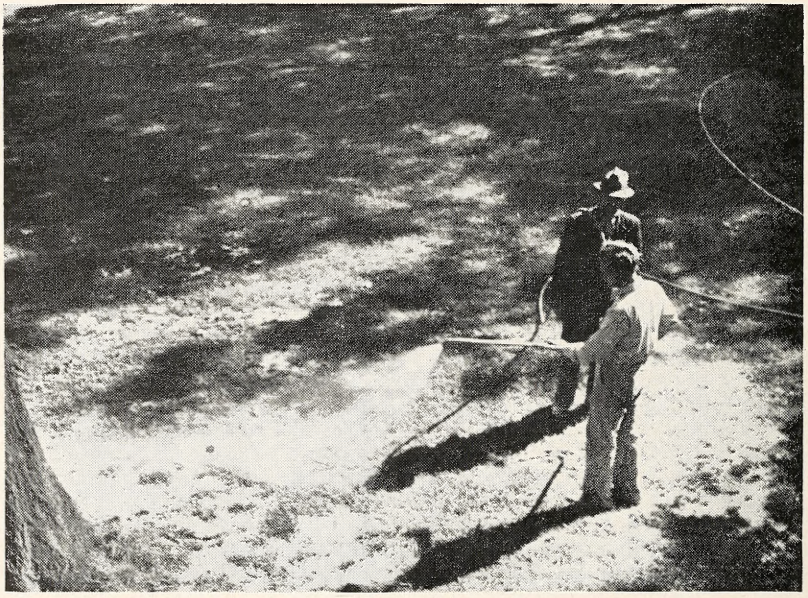
From these traps the following Japanese beetles were caught in 1941: Asheville—(traps operated on control basis to reduce infestation); Burlington 62; Charlotte 12; Durham 27; East Spencer 349; Elizabeth City 53; Goldsboro 2; Greensboro 98; Hendersonville 5; High Point 84; Lexington 4; Raleigh 68; Rocky Mount 26; Salisbury 232; Spencer 52; Weldon 13; Wilmington 52; Wilson 8; Winston-Salem 97.

During June and July, 1942, the following Japanese beetle traps were placed: Asheville 200; Burlington 200; Charlotte 600; Durham 600; East Spencer 100; Elizabeth City 200; Fayetteville 300; Gastonia 200; Goldsboro 200; Greensboro 600; Hamlet 200; Hendersonville 200; High Point 400; Lexington 100; Raleigh 600; Reidsville 100; Rockingham 100; Rocky Mount 200; Salisbury 200; Sanford 100; Thomasville 100; Tarboro 100; Wadesboro 100; Washington 100; Weldon 100; Wilmington 500; Wilson 200; Winston-Salem 600.

The following Japanese beetles were caught in 1942: Asheville*; Burlington 3; Charlotte 25; Durham 5; East Spencer 83; Elizabeth City 31; Fayetteville 7; Gastonia 106; Goldsboro 3; Greensboro 19; Hamlet 3; Hendersonville 1,434; High Point 18; Raleigh 46; Reidsville 4; Rocky Mount 16; Salisbury 29; Sanford 100; Thomasville 1; Waynesville 1; Weldon 9; Wilmington 18; Wilson 11; Winston-Salem 23.

SOIL TREATMENT

During the fall of 1940 the following areas were treated with 500 pounds of lead arsenate per acre to kill Japanese beetle grubs in the soil: Burlington 19; Charlotte 12; Durham 30; East Spencer 18; Elizabeth City 16; Goldsboro 5; Greensboro 23; High Point 22; Lexington 5; Raleigh 33; Rocky Mount 21; Salisbury 21; Sanford 5; Spencer 21; Wilmington 35; Winston-Salem 64.



Soil treatment for Japanese beetle control.

* Traps in Asheville operated on a control basis.

During the fall of 1941 the following areas were treated with 500 pounds of lead arsenate per acre for Japanese beetle control: Burlington 3; Charlotte 12.5; Durham 12; Greensboro 63.5; High Point 80; Raleigh 28.5; Rocky Mount 30.5 Wilmington 10; Winston-Salem 60.

Japanese beetle soil treatment was made possible by special legislative appropriations which are shown in the Auditor's report.

Phony Peach Eradication

J. A. Harris is State Coöperator in charge of this project which was carried out in coöperation with the Federal government.

No diseased trees have been found in North Carolina since 1939. In June 1941 all previously known infected properties and all properties within one mile of these were inspected. No diseased trees were found. Inspections were made on 1,707 properties which included 67,259 trees in Anson, Polk, Robeson, Rutherford and Stanly counties.

In 1942 all properties and adjacent properties found infected within the past three years were carefully inspected again.

Since no phony disease has been found in North Carolina for three successive years, we are in a position to be freed from all quarantines caused by the presence of the disease in the state. This is one of the most thorough and far-reaching eradication programs ever carried out in the state and we are the first Southern State to be classed as "phony free."

Nematod damage in bulb field.

EUROPEAN CORN BORER

Scouting for European Corn Borer was done by J. A. Harris and D. L. Wray. In the fall of 1940 inspections showed no additional counties infested (Camden, Currituck and Pasquotank counties previously reported as infested) but a spread of the corn borer within the infested area was noticed.

During the inspections in the fall of 1941 Tyrrell County was also found infested.

NARCISSUS BULB INSPECTION

This valuable inspection service has saved the North Carolina bulb industry from certain destruction. J. A. Harris and D. L. Wray have carefully carried out this work.

In 1941 field inspections included 115.2 acres on 11 properties. Nematode was found on 3 properties on bulbs which had been shipped into North Carolina during the fall of 1940. Storage inspections of all bulbs not found infested in the field showed no further infestation.

In 1942 field inspections included 79 acres on 13 properties. Nematodes were found on 5 properties. With one exception these infestations were found in bulbs which were shipped into the state in 1941.

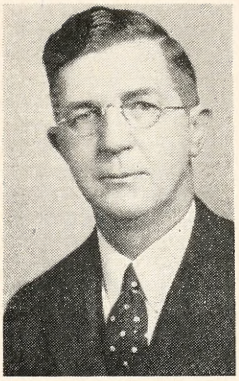
All bulbs showing infestation in 1941 received the approved hot water treatment and those found infested in 1942 will receive the hot water treatment this fall.

North Carolina maintains one of the best bulb inspection services in the Country and out-of-state officials have made special trips into the state to observe our bulb inspection work. Our two staff members who conduct this work spend about six weeks each year on this project.

Potato Tuber Moth Survey

North Carolina was selected as one of 16 states to be included in a coöperative State-Federal survey of potato areas to determine the spread of the potato tuber moth. The insect has long been known to occur over a wide area in North Carolina but it was decided that a systematic survey was needed. Messrs. Harris and Wray of our staff found the insect in Camden and Pasquotank counties and Federal inspectors found it in Beaufort and Pamlico counties.

Division of Markets



Randal B. Etheridge

Randal B. Etheridge

The activities of the Division of Markets were broader in scope during the past biennium than at any period during the history of the Division, which was partially due to legislation passed by the General Assembly of 1941 giving increased authority in the field of marketing. The experience which we have acquired has made it possible for us to be of greater service to the farmers during the difficult period we are now experiencing. The emergency brought about by the war presented new and difficult problems never before experienced.

The transportation of farm products by motor trucks, due to the rubber shortage and gasoline restrictions, has influenced the method of marketing certain farm products grown or produced in the State. We have been instrumental in helping individuals, firms and corporations in getting trucks to transport farm products and in getting the necessary equipment and machinery used in the processing of agricultural products. Assistance was given in getting additional allotments of gasoline for several of the truck sections in the eastern part of the State which made it possible to move perishable commodities a part of which would otherwise have spoiled. Anticipated labor shortage for harvesting was pointed out to the growers and they were directed the procedure to follow to procure labor camps. Technical information has been furnished to the Department of Conservation and Development which was seeking to bring new industries into the State and also to the State Utilities Commission in connection with rates on agricultural products.

Marketing Authority

The Act creating the State Marketing Authority declared it to be the policy of the State to promote, encourage and develop the orderly and efficient marketing of products of the home and farm. Broad powers to carry out the policy were authorized. To secure these aims, there was created an incorporated public agency composed of the members of the State Board of Agriculture with the Commissioner of Agriculture as Chairman. Markets and marketing organizations associated with the Authority are as follows:

Raleigh: The Raleigh-State market was organized for the purpose of making available to the growers in the State a

terminal market for fruits and vegetables, field crops, poultry and eggs and miscellaneous farm products. One of our employees is in charge of the market. Eight hundred truck and trailer loads of miscellaneous vegetables were sold through this market, making a total of 7,605,090 pounds. In addition, 10,429 pounds of poultry were sold for $2,000.27.

Smithfield: The County Commissioners of Johnston County erected a building for the handling of fruits and vegetables, field crops, poultry and eggs and miscellaneous farm products. A representative of the Division directed the operation in its entirety, and the farmers sold twenty-six different farm products for which they received $23,752.58. In addition, 8,170 bushels of cucumbers were sold for processing. There would have been no market for a considerable part of the produce sold at this market due to the fact that the farmers brought in small quantities and there were no local buyers to handle many of the products sold.

Kinston: We assisted in organizing and in the marketing of fruits and vegetables and poultry and eggs. This market furnished an outlet for the growers in five or six counties in that section of the State and 2,288 cases of eggs were sold for which the farmers received $21,628.16; and 605,400 pounds of poultry for which they received $107,784.60. In addition, 21,620 packages of produce, principally snap beans, potatoes, and corn were sold.

Wallace: A representative helped the management in directing the auction market. On this market the farmers sold 717,333 packages of fruits and vegetables, amounting to $1,329,130.20.

Clinton: A representative worked with the management of the Clinton Produce Exchange in selling at the auction market 302,183 packages of miscellaneous fruits and vegetables. For the produce sold on this market, the farmers received $313,384.16.

Mount Olive: One of the specialists supervised the auction market. There were sold on this market 283,893 packages of fruits and vegetables. For this produce the farmers were paid approximately $230,000.00.

Faison: At the request of the City Commissioners, we assigned a representative to that auction market and he assumed full responsibility for the management. The farmers sold 158,286 packages of fruits and vegetables for which they received $232,251.03.

Castle Hayne: Assistance in the various functions of marketing of lettuce, beans, beets, squash, cucumbers, peppers and other truck crops was given to the members of the Castle Hayne Growers and Shippers.

Wrightsboro: A specialist assisted in the various functions of marketing of beets, beans, lettuce, cucumbers, peppers, squash and other vegetable crops for members of the Hanover Mutual Exchange.

Goldsboro: The Wayne Farmers Coöperative Service and Exchange placed their facilities and services of their organization under the provisions of the Act. General assistance has been given.

Elizabeth City: A representative assisted in the management of the auction market and educational work in the grading and preparation of fresh peas for market was given.

Candor: The Candor Roadside Market furnishes an excellent outlet for products grown in Montgomery, Richmond, Moore and Scotland counties. The City Commissioners passed an ordinance requiring that all produce sold on that market be sold on the basis of grade. Our representative managed the market in 1941 and he was given authority to prevent the sale of products of no market value. Nine hundred and seventy-three truckloads of produce, consisting principally of cantaloups, watermelons, peaches and tomatoes were sold on this market.

Whiteville: We organized a pecan market to serve that section of the State and sold for the farmer's account 106,430 pounds of pecans. They received $9,046.55 for them.

Sanford: Specialists organized and managed an auction market for Lee and the adjoining counties for poultry, and all of the surplus eggs brought in were sold for the farmers. At this market we sold 48,185 pounds of poultry, amounting to $9,321.21 and 443 cases of eggs were sold for $2,917.82. Assistance was given in the grading of poultry and eggs.

Fairmont: Representatives of the Department assisted in organizing, grading and in helping sell the poultry and eggs at the poultry auction market. 23,184 pounds of poultry were sold for which the growers were paid $4,868.64 and 1,800 dozen eggs were marketed.

Rocky Mount: Assistance was given in the grading of poultry and eggs at the poultry auction market.

HANDLERS' ACT

For a number of years the farmers have been encouraged to grow certain truck crops by individuals, firms, and corporations who agreed in writing to buy the products at a specified price, based on grades or specifications formulated wholly or in part by the buyer. Years in which the market price of the product was such that the handler would show a profit by fulfilling his contract the products would be accepted. Years in which the price prevailed low and there was no opportunity for a profit many contractors, principally out-of-state firms, would grade so rigidly that the growers would become discouraged and discontinue the harvesting of the crop; or, the contractors would, without informing the farmers of their intention, close their office and leave. And, since there was no other outlet, the cost of producing the crop, in many cases, would be a total loss. To

correct this situation the General Assembly of 1941 passed legislation, "An Act to Authorize the Regulation of Unfair Practices by Handlers of Farm Products," Chapter 359, Public Laws, which requires that individuals, firms and corporations who incur or may incur financial liability furnish to the Commissioner of Agriculture sufficient and satisfactory evidence of their ability to carry out their contract or furnish a satisfactory bond in an amount not to exceed ten thousand ($10,000) dollars. The Act was enforced and the growers can now contract with the assurance that they will be protected.

FRUITS AND VEGETABLES

Specialists instructed growers in modern marketing practices, including proper stage of maturity at which to harvest certain crops, proper handling and grading, processing, packing and loading and helped in making sales. Assistance in the functions of marketing was given to producers in virtually every county growing fruits and vegetables for commercial purposes.

Representatives met with organized groups in practically all producing areas at which time information was furnished with respect to marketing practices which had proven profitable to growers in this and other states, pointing out to them that all purchases made by the Government for Lend-Lease shipment and purchases made also by the Army and the Navy and the commercial trade were bought on the basis of Federal standards; and, in order to sell to them, it would be necessary that the products be graded to meet these standards. More than five thousand farmers attended these meetings held throughout the State. Considerable effort was spent in bringing to the attention of the producers the use of modern facilities for grading and processing. They were urged to buy the equipment in order to more successfully compete with other states.

Intensive work was carried on with the strawberry growers in Wayne, Duplin, Pender, Columbus and Sampson counties in the grading and preparation of strawberries for market. Those growers who packed strawberries under the program received an attractive premium. The proper stage of maturity at which cantaloups should be harvested was brought to the attention of growers in Scotland and Chowan counties. A specialist assisted potato growers in Robeson and Bladen counties in the harvesting and grading and all offered for sale were sold for the growers' account. One specialist worked with the growers in Robeson and adjoining counties advising them with reference to the best methods of harvesting, grading and packing tomatoes. Growers in Macon, Jackson, Transylvania, Henderson, Haywood, Buncombe, Avery, Polk, Surry, Wilkes and Madison counties

were informed of modern marketing practices, including the proper methods of grading and packing apples, snap beans and other fruits and vegetables grown in those counties. Assistance was, also, given in securing and operating grading machinery and in the marketing of certain commodities. Considerable help was given to the growers of sweet potatoes in Johnston, Harnett, Cumberland, Nash, Rutherford, Polk, Richmond, Montgomery, Craven, Carteret, Lee, Robeson, Martin and Beaufort counties in an effort to relieve an acute marketing problem during the late spring months of 1942 which was brought about by a large production of sweet potatoes in the country and the lack of motor truck buyers to which they had been accustomed for a number of years.

The North Carolina Peach Growers Society unanimously requested that we assign a representative to the peach section in 1941 for the purpose of requiring that all peaches packed conform to the grade as marked on the package which was done. At their request, one specialist was assigned to work with the merchandising committee of the Society. He was in charge of the advertising campaign which consisted of display advertisements in the newspapers and the daily announcements made over several of the radio stations in the State.

A serious situation developed in 1942 due to a shortage of strawberry crates and one of our representatives acted promptly in alleviating the situation by locating thousands of used containers. Conferences were held with members of the processing industry which resulted in the establishment of a cold pack plant at Wilmington capable of using 4,000 crates of strawberries daily. Plans were made for the processing of berries with sulphur dioxide for Lend-Lease purposes. Prices remained at a level sufficient to move the crop to a better advantage through the regular channels and the processing of berries with sulphur dioxide was not used.

In recent years the eight or nine thousand cars of Irish potatoes produced in North Carolina were shipped in burlap bags. The emergency created an acute situation in burlap; and, in an effort to get containers in which to move the crop in 1942, we were instrumental in getting plants which formerly made barrels to reopen. We helped these plants to get the necessary equipment and the materials used in making containers which required a high priority rating. Assistance was, also, given to other plants in getting priority for materials used in making miscellaneous fruit and vegetable packages. It appeared that we would experience difficulty this year in getting enough cars to move the crop, based on 24,000 pounds per car which has been the weight loaded in recent years. To conserve trans-

Inspecting peaches in the sandhills.

portation, growers and shippers were urged to load 30,000 pounds.

One specialist was located at Washington, North Carolina, for the purpose of furnishing the growers and shippers accurate, up-to-date information which would guide them in selling the crop. Since prices fluctuate from day to day due to increased or decreased carlot movement, this information was furnished each day. The program has to do with stabilizing the price for the whole area during a given period, based on market conditions.

A representative working in coöperation with other State and Federal institutions made a survey in twenty-two counties in western North Carolina to secure information on the marketing practices and available market facilities. The information obtained has been used in developing marketing programs in that section of the State.

A very large percentage of fruits and vegetables marketed by the growers in North Carolina is bought and sold on the basis of grades and representatives of the Division, all of whom are licensed by the Secretary of Agriculture, act in a neutral capacity in certifying the grade. Each year we employ 150 seasonal men for this service which is made available to every section in the State from the seventy temporary field offices. This work is highly specialized and to qualify one receives intensive training and has to successfully pass an examination before he is employed by the Department and licensed by the Secretary of Agriculture. The service is self-supporting. This project of work is by far the largest in the Division and the volume is increasing from year to year. The specialists inspected and certified as to grade 9,980,338 packages of fruits and vegetables which are equivalent to 28,399 carloads. Commodities inspected included peaches, strawberries, tomatoes, cantaloups, watermelons, corn, apples, peppers, cucumbers, beans, sweet potatoes, shelled peanuts, huckleberries, squash, egg plant, dewberries, peas, lettuce, cabbage, lima beans, carrots, okra and beets.

All Farmers' Stock peanuts purchased by the Federal Government for diversion into oil were bought on the basis of Federal grades. A specialist, under a coöperative agreement with the Agricultural Marketing Administration, trained, licensed and supervised the work of fifty peanut inspectors who certified as to grade the 116,000,000 pounds of peanuts bought.

Raleigh has been designated by the U. S. Department of Agriculture as a receiving point market. Two employees have been licensed by the Secretary of Agriculture to make Federal terminal inspections. This type of inspection deals with incoming produce when the quality, condition or grade is thought to be below contract specifications. It is used in adjusting disputes between shippers and receivers. Since the inauguration of the service, eighteen such inspections have been made, including several cars for the Federal Quartermaster Market Centers and State institutions.

In many instances the growers of certain communities did not have an organized channel through which to market their products and we directed the assembling of the products and negotiated a sale for them or brought together the sellers and buyers. Hundreds of thousands of dollars worth of farm produce were marketed by the two methods mentioned. Information with respect to the dates which certain commodities would be harvested, quantity and quality, and points at which the products could be obtained were sent to the purchasing agents for the army camps and to prospective buyers in the larger terminal

markets and in the larger towns in adjacent states with the view of increasing the sale of the products grown in North Carolina.

Growers and shippers were informed of the needs of the army camps. A total of 233,713 packages of produce amounting to $539,785.63 was sold to the army camps in the State while many thousands of dollars worth were sold to the camps in adjoining states. Direct sales from farmers to the camps amounted to approximately thirty-five per cent of the value of the products sold. A considerable portion of the produce which moved into the camps was negotiated by our representatives for the account of the farmers or handlers. Army camps in this and adjoining states, as well as the Quartermaster Market Centers in Chicago, Columbia, Macon and Norfolk, were informed as to the volume and the quality, along with the date the food products would be available.

Members assisted the Agricultural Marketing Administration in the surplus removal of 853 cars of peaches, carrots, potatoes, cabbage and sweet potatoes. Purchases of this kind have a beneficial effect on stabilizing the price.

The regulation promulgated by the Board of Agriculture requiring that all potatoes sold for seed purposes in North Carolina meet the specifications of the U. S. Grade No. 1 or be plainly marked "Not Graded" was continued and growers and shippers reported that the quality of seed potatoes received in the State during the past two years showed a decided improvement over that of previous years. Inspections were made in practically every county of the State that bought seed potatoes from sources outside of the State for planting in the State.

FIELD CROPS

The program of work has been to advise and assist farmers, individually and in groups, as to market requirements and in the preparation for market of small grains, lespedeza seed, soybeans, market hays and straw. Seventy-five counties were visited to discuss important problems in marketing. Assistance in finding a market for these crops has been given by furnishing up-to-date information on the location of markets, handlers and processors. Specialists helped farmers and handlers sell approximately 300,000 bushels of wheat, oats, soybeans, corn, rye and lespedeza.

Many timely articles for the newspapers of the State have been prepared. Two motion pictures in color were made and shown in group meetings. These pictures illustrate the best methods of preparing and marketing lespedeza seed and commercial hays.

LESPEDEZA GRADES

The program for improving the marketing of lespedeza seed was started in 1939. At that time the first grades for lespedeza seed were adopted by the North Carolina Department of Agriculture. This program was continued and expanded and the grades were revised and improved. The value and progress of this program is readily seen by comparing the quality of lespedeza seed marketed before and after the program was inaugurated, measured by analyses made by the State Seed Laboratory. The North Carolina grades for lespedeza seed are now recognized by the seed trade and are used as a basis for determining the market value. Thirty-three counties in the eastern and central part of the State were visited to discuss problems concerning lespedeza seed.

HAY GRADING

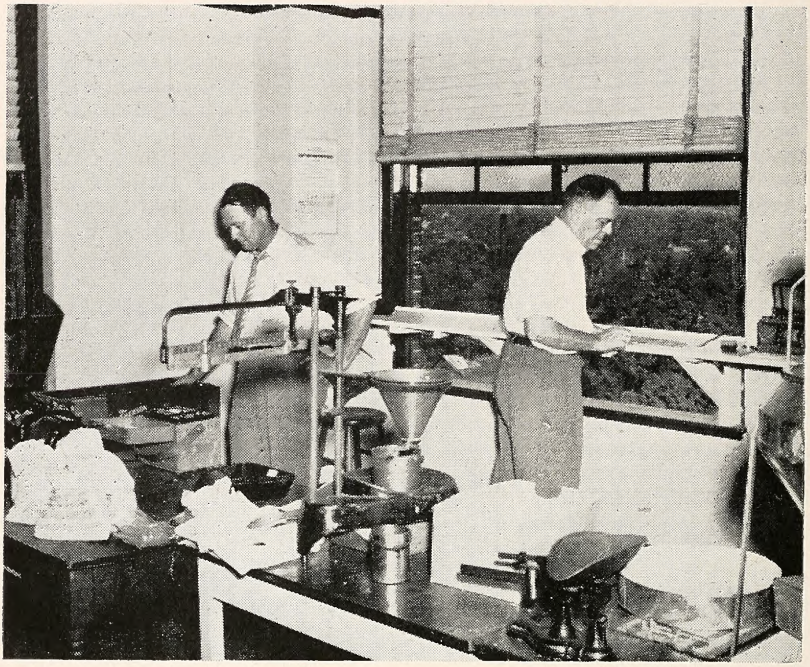
Attention has been given to the preparation and marketing of lespedeza, soybean and cowpea hays and straw. Two members have been licensed by the Secretary of Agriculture to inspect and certify as to grade hay of all kind. Assistance was given to growers and shippers in fifteen counties, largely in the eastern and central part of the State, in the preparation for market and the marketing of 100 cars of commercial hays and straw.

The marked increase in the production of small grains milled for feed and flour in the State has resulted in new problems concerning market quality and farm storage. Specialists coöperated with the Piedmont Millers Association and State agencies for the better handling, storing and marketing of small grains and corn. Thirty-nine counties have been visited to discuss problems of storage and marketing of grain crops.

Grain grading schools for mill men were held in Goldsboro, Rocky Mount, Graham, Albemarle, Newton, Asheboro, Winston-Salem and Asheville. The total attendance of 134 consisted largely of mill men but included a few county agricultural agents and vocational teachers.

A total of 105 illustrated lectures was given at various meetings which consisted of evening adult classes of the vocational schools, father and son banquets, Grange meetings, civic clubs and group meetings. A total of approximately 5,260 adult farmers attended these meetings.

Assistance was given to representatives of the U. S. Department of Agriculture in connection with commodity loans on farm-stored corn and in the preparation for farm loans on wheat and soybeans. A specialist was designated by the AAA to officially supervise the sampling and to grade all corn, wheat and soybeans eligible for farm loans in the State. A total of 36,000 bushels of farm stored corn in Beaufort, Currituck, Pasquotank, Perquimans and Hyde counties was certified as to grade.



Grading grain for North Carolina farmers.

Representatives officially sampled 6,000 barrels of corn grits and 23,400 barrels of whole yellow corn meal sold by the Interstate Mills of Charlotte to the Agricultural Marketing Administration for Lend-Lease purposes.

TOBACCO

Because of the expansion of Government inspection of tobacco, demonstration work in tobacco standardization has been expanded to acquaint farmers with its use on the graded markets.

Our specialist and specialists of the Agricultural Marketing Administration, with whom we have a coöperative agreement, held 352 farm demonstrations with attendance of 8,979 farmers in coöperation with county agents and vocational teachers. Evening adult classes were held in thirty-two vocational schools with an attendance of 912. Instructional work was carried on in 128 vocational schools; 5,478 agricultural students attended these classes. In addition, exhibits and demonstrations were held at fairs, field days and with civic clubs in fourteen counties. At sixteen meetings, 4,155 pieces of literature were distributed. A bulletin on marketing tobacco was prepared and 5,000 copies were distributed.

In the Burley section of western North Carolina, assistance was given the Farmers' Federation, Incorporated, Asheville, in

Growers acquaint themselves with tobacco grading.

setting up an agency to act as agent for the Commodity Credit Corporation to assure the growers that they would receive a price equal to 85% of parity for tobacco sold. During the 1941 season, 46,090 pounds of tobacco were received by the Farmers' Federation from 256 growers. This tobacco was later resold and the growers whose tobacco was taken in received an average of $2.50 above the price guaranteed by the Government.

Work was done with warehousemen and tobacco dealers throughout the Flue-cured and Burley belts in the interest of improving the auction system of selling tobacco.

LIVESTOCK

The program to assist farmers in the grading and sale of spring lambs was continued. Lambs were graded and sales assistance rendered in the following counties: Ashe, 777 lambs; Alleghany, 1,205 lambs; Alamance and Chatham, 182 lambs; Washington and Tyrrell, 435 lambs, and Watauga, 1,737 lambs. Assistance in the selling of wool was given through the organization of pools and the sale of same in the counties of Alamance, Ashe, Alleghany and Watauga. Almost 50,000 pounds of wool were sold through these pools.

A bulletin advertising the merits, as well as the source, of feeder cattle in North Carolina was compiled, printed and distributed to 4,000 prospective customers. Numerous indirect sales came about in this manner. In addition, a coöperative project involving the State Highway and Public Works Commission for the purchase and resale of stocker and feeder cattle was inaugurated. Through the facilities of this project, 854 cattle were marketed for the farmers in western North Carolina and resold for $52,486.73 to ninety-five different farmers in twenty-five different counties in eastern North Carolina. In order that farmers buying these feeder cattle, as well as those feeder cattle purchased elsewhere, might have the best market for their cattle, a list of cattle on feed was prepared in the winter of 1941-42 and circulated to all of the important fat cattle dealers operating in the Eastern territory, including the large Northeastern Seaboard cities. Cattle feeders were informed of the market trends through personal visits, market news circulars and public sales where a total of 450 head of fat cattle belonging to the State were sold.

Cattle purchased from western North Carolina farmers for sale to eastern Carolina farmers.

POULTRY AND EGGS

Specialists were in charge of the work at the twelve Federal-State egg grading stations. These stations graded approximately 3,000,000 dozen eggs which represented a large increase over any previous biennium. Assistance was given to the grading stations, producers and handlers in securing bids and furnishing eggs for army camps, Veterans' Facilities, as well as for the Surplus Removal Program under the Agricultural Marketing Administration.

The program to remove the surplus eggs during 1942, developed by representatives of the Division and of the Coöperative Marketing Associations along with the program developed by our members in coöperation with large producers and handlers of eggs, represented one of the most outstanding pieces of marketing work ever developed in the Southern States. The active program was the outcome of many discussions in which the agents of the U. S. Department of Agriculture and State College participated in response to general complaints from small producers that they could not sell their eggs for the prices quoted on the radio and in the newspapers, even though the Government had asked for an increased production and had guaranteed a specified price. A total of 31,894 cases of eggs representing 956,820 dozen of eggs were sold to the army camps, Veterans' Facilities, Agricultural Marketing Administration and to the terminal markets in the East.

Four main assembling routes were established: Charlotte district through FCX; Winston-Salem district through FCX; Western district through Farmers' Federation; Central Piedmont district through Farmers Mutual Exchange and the Eastern district by the State Department of Agriculture.

The two trucks operated by the employees of the Division collected eggs at the following points: Ash, Benson, Bessemer City, Bethel, Beulaville, Bladenboro, Bolivia, Burgaw, Chadbourn, Cherryville, Clarkton, Clinton, Dallas, Delway, Dunn, Elizabethtown, Fairmont, Garland, Goldsboro, Greenville, Jacksonville, Kenansville, Kerr, Kinston, Lumberton, Maysville, Midway, Mount Olive, New Bern, Newton Grove, Orrum, Piney Green, Pollocksville, Raleigh, Richlands, Robersonville, Rocky Mount, Rosebore, Salemburg, Shallotte, Smithfield, Supply, Tarboro, Trenton, Vanceboro, Wallace, Washington, Whiteville, Williamston, and Wilson.

The eggs collected were turned over to the sales organization of the coöperatives. Eggs were collected from approximately 175 receiving points throughout the State, and this program reached more farmers than any other surplus program ever inaugurated in North Carolina. Assistance was given by members in the collection of eggs throughout the State. During the heavy movement, ten specialists helped in the program. At the time the program started, eggs in many sections of the State had

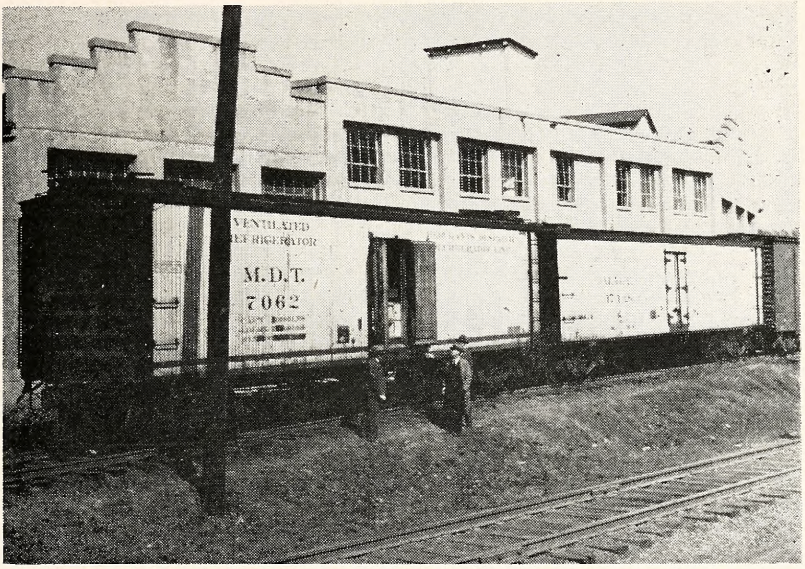
Candling eggs at a Federal-State egg grading station.

declined to as low as fifteen cents per dozen. This project immediately raised the level and stabilized the price at a minimum of twenty-two cents per dozen at practically all points in the State.

An acute shortage of egg cases threatened the entire program. To alleviate the situation, a representative spent seven days at Fort Bragg explaining to the one in charge of salvage of each kitchen the seriousness of the situation, and he requested that the cases be made available for salvage which in turn would be purchased by the handlers in North Carolina for reuse. Excellent coöperation was given by the Army officials and highly satisfactory results were obtained.

EGGS

The enforcement of the Cold Storage Egg Law, which requires that cold storage eggs be sold as such, was continued and the compliance was much better than in previous years. Approximately five hundred inspections were made. At the time the inspectors visited the stores, managers were informed as to the best method of handling and merchandising poultry and eggs. Two individuals were convicted in Asheville for selling cold storage eggs as fresh eggs and were given a fine of $100 each and placed under probation for one year.



Two carloads of graded eggs moving to market.

Dressing plants in the State were visited and suggestions were made which resulted in an improvement in the handling and marketing of poultry. The dressing plant of the Farmers' Federation in Asheville has been accepted by the Veterans' Facilities, and McNeil's poultry plant at Fayetteville has been approved by the Army. This approval makes it possible for these two plants to sell to the Federal institutions mentioned.

Specialists gave grading demonstrations of poultry at all of the auction markets. At these markets the farmers were shown the type of poultry desired by the consuming markets in the East.

DAIRY MARKETING

The dairy marketing program was carried on by demonstration lectures in the public schools; display and printed materials were distributed; illustrated lectures were given; classes and

exhibits for civic organizations and Parent-Teacher Associations, newspapers and radio promotion programs were conducted. The objective of the work was to increase the consumption of milk. There were approximately 25,800 contacts made through meetings and the various programs.

In addition, assistance was given to various promotional programs which were beneficial to the dairy industry. June Dairy Month publicity, the School Milk Program for underprivileged children and the program to increase the consumption of milk by industrial workers were successful. The School Milk Program was organized in Greensboro with the city school system as sponsor. Approximately 700 one-half pints of milk were sold daily for one cent per bottle. The program to increase the consumption of milk by industrial workers was inaugurated by the Chatham Manufacturing Company, Elkin.

We are coöperating with the National and State Nutrition programs in an effort to develop an appreciation of the importance of milk for physical strength and maximum efficiency.

MARKET NEWS

Since the last biennium, agricultural conditions have changed considerably. The changes were of an emergency condition and have placed a larger load on the market news service. More market information has been required as war activities have been intensified, especially for fresh fruits and vegetables and other perishable commodities.

Market prices have fluctuated in response to local supply and demand influences. These changes in market prices are extremely important to the producer when his products are ready to be marketed. If the produce reaches market when there is a surplus, he may sustain a net loss on his entire season's operations. It is to his interest to be informed of day-to-day changes in market conditions.

Our objective was to provide market news coverage on price, supply and demand conditions at important State and terminal markets and in producing sections in keeping with a good marketing program.

To distribute the information to the public by newspapers, radio and mail reports in time to be of value, the Raleigh office was part of a system which functioned somewhat like a commercial press association. Over 8,000 miles of U. S. Department of Agriculture leased telegraph wires link together the offices in the larger cities and temporary offices in producing areas. And, like the press associations, the news is collected by reporters—market news service reporters.

From temporary field offices in Chadbourn for strawberries, Washington for potatoes and Hamlet for peaches and watermelons daily mimeographed reports, in coöperation with the U. S. Department of Agriculture, were issued to interested

Gathering price information for a market news report.

persons. In addition, from Raleigh market news was released to daily and weekly newspapers, radio stations and press associations covering all farm products being marketed. Weekly mimeographed reports were mailed to producers on cotton, feedstuffs, peanuts, poultry and eggs, dairy products and livestock, as were seasonal reports to those interested in tobacco, fruits and vegetables and Christmas greens.

Since the outbreak of the war, as an economy measure, mail reports to producers have been decreased while added emphasis has been given to newspapers and radio releases. Market information is now mailed to 1,500 producers each week while daily releases are furnished nine radio stations, six newspapers and two press associations.

It is significant that prices of many products in the market news reports were generally quoted in terms of Federal standards. Otherwise, prices would have no uniform meaning in all parts of the country.

COOPERATIVES

Assistance was given to the twenty new coöperatives which included the writing of their charters, by-laws and marketing agreements. Suggestions were made to these and other organizations looking toward a more efficient and economical operation. One of the specialists helped many of the organizations in connection with tax matters and assisted others in their financing which was done through the local banks and the Bank for Coöperatives in Columbia, South Carolina. The annual reports which they are required to make to the Division of Markets were received and filed.

PERSONNEL OF THE DIVISION

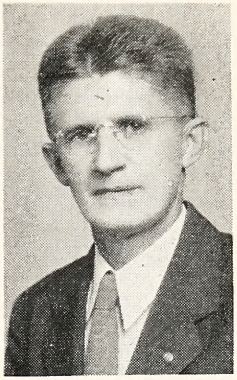
The increase in marketing activities during the biennium has necessitated an enlargement of personnel. The marketing specialists have been carefully selected for ability, training and practical experience in this vital field of agriculture. It has been a matter of pride that both the permanent and temporary employees have demonstrated unusual qualifications in their lines. Their harmonious, loyal and enthusiastic services have integrated for effective accomplishments.

ACKNOWLEDGMENTS

It has been a pleasure to collaborate with branches of the U. S. Department of Agriculture, with which coöperative agreements have been operated, State College and all others who have contributed to our projects of work. Particular appreciation is expressed to the county agents and vocational agricultural teachers who have frequently rendered valuable assistance in accomplishments of the Division.

State Museum

Harry T. Davis



Harry T. Davis

Global War, and preparation against and for it, has quite properly been a major factor in the activities of this Museum during this biennium. It has modified, but never changed, our educational function of presenting the Natural History and Natural Resources of North Carolina. Exhibits have been improved throughout the Museum and appropriate new exhibits have been added.

War restrictions on travel have affected both the number and character of our visitors. We have changed our hours to meet the needs. Our services to visitors and public conveniences have shown improvement and we can thank WPA for this margin of betterment.

Accessions

This is the stuff of which both exhibits and study collections are built. For obvious reasons, not all accessions make exhibits, but systematic specimen storage and their detailed records make a body of useful information. This has been emphasized in these days of strategic and critical minerals.

Below is given a summary of accessions for the biennium. This brief report acknowledges only major accessions by name.

Accessions by groups were:

Rocks and Minerals	335
Fossils	10,952
Forestry and Botany	32
Invertebrates	42
Fishes	54
Reptiles	105
Birds	156
Mammals	37
American Indian Archaeology	1,235
Agriculture	42
Library Volumes	29
Library Bulletins and Pamphlets	470
Pictures	162
Lantern Slides	236
Total	3,887

Some significant accessions not otherwise noted in this report are:

The second North Carolina fulgurite (lightning fused sand tube) from a sandhill at Nags Head, donated by G. F. Hill, October, 1941.

A fine specimen of the rare shell fossil, Fasciolaria acmensis, from Acme, donated by John Wright Butler, Jr., October, 1941; and three large Mastodon teeth from Winnabow, Brunswick County, by G. C. Earp, October, 1941.

A large Crevalle from Tom Eaton, Hatteras, November, 1940; and the first specimens we have of the Snake Fish and the Lump Fish were secured in August, 1941.

Two rare owls, one long eared by Billy Singleton, Raleigh, November, 1940; and one saw whet by Sam A. Walker, Pea Island, December, 1940.

A collection of 1,200 Indian artifacts from Nash and Edgecombe counties which were donated by the late Dr. Francis H. Craighill in September, 1941.

During May, 1942, Col. H. G. Davids, Raleigh, supplied us with some primitive Philippine fighting blades which make a timely exhibit.

The twenty-nine books listed were donations and purchases, the latter key volumes for the working Library. The Board of Agriculture has designated this The Brimley Library of Natural History as a tribute to the long-time and valuable services of H. H. Brimley to the State Museum.

Foremost contributor to this library during the biennium was C. S. Brimley who gave forty-three volumes of scientific papers and some two hundred and thirty-five separate bulletins which are very valuable additions.

In addition, we have received scores of valuable bulletins, and volumes sent us on an exchange basis from other museums and public institutions.

FIELD WORK

To properly carry on the activities indicated by War preparedness and War needs, field travel has necessarily been considerably greater than provided for in the biennial budget allowed us. We have worked in coöperation with the State and U. S. Geological Surveys for strategic and critical War mineral products, especially for mica, bauxite (aluminum ore) and high aluminum clays.

Early in the biennium, before active War preparations, we made a coöperative arrangement with the Academy of Natural Sciences, Philadelphia, by which they provided the part-time services of Dr. H. G. Richards, Paleontologist, for a badly needed restudy and revision of our Coastal Plain Geology, and its natural resources. War conditions soon made this a matter of considerable importance for our large military establishments needed the building stone, water supplies, etc., for which the geology was a basic requirement. The State surveys of past years have paid handsome dividends in connection with these military establishments. The marl deposits visited and recorded may become quite important to our farmers.

Late in 1941 we applied for and received a grant from the American Philosophical Society, Philadelphia, which took care of Dr. Richards' expenses on this survey. This aid from the Academy of Natural Sciences and the American Philosophical Society is acknowledged with thanks. Likewise, we acknowledge the assistance of the State and U. S. Geological Surveys and the geological departments of our universities.

This survey has not been as complete as is desirable but it involved some 7,500 miles of field travel, mostly over week-ends, and the collection of some 11,000 specimens of about 460 species from 180 different sites.

These specimens are being cleaned, identified and labeled for exhibits and for systematic storage which will be by far the best such collection ever made from our State. A preliminary report covering this work is being prepared.

In November, 1941, the Director participated in the studies of the pilentery shrub, on Core Banks, Carteret County, for its possibilities in checking beach erosion. This was upon the suggestion of President Roosevelt made to Governor Broughton.

In May, 1942, the American Association of Museums met in Williamsburg, Virginia, one of the few meetings held in the South. The three scientific workers on our staff attended this meeting, which featured Museum exhibit techniques and Wartime activities. The museums and parks of Tidewater, Virginia, were visited and studied.

EXHIBITS

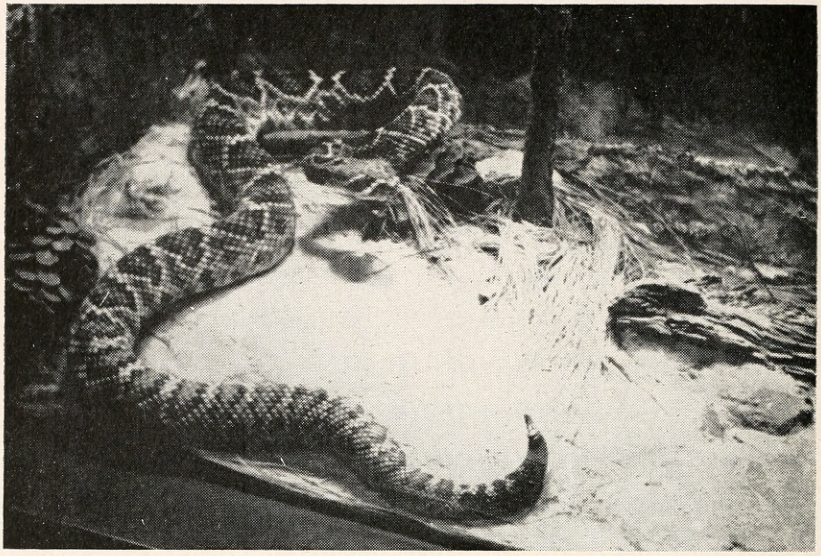
The Fossil exhibits in Hall I have been expanded and relabeled. In this Hall are also shown the twenty-one new watercolor paintings of N. C. flowers by Gene Erwin and Frances Durant.

Mineral and rock exhibits have been cleaned up and relabeled in Halls II and III, but there is much detailed work yet to be done to make these good exhibits. The Eastern Carolina Shell rock, the bauxite (aluminum ore) furnished by the National Museum (U. S. Geological Survey) and the mica, chromite, and olivene, from our collections, are featured as War minerals. In addition, collections of bauxite have been prepared and distributed over the State to promote search for this aluminum ore.

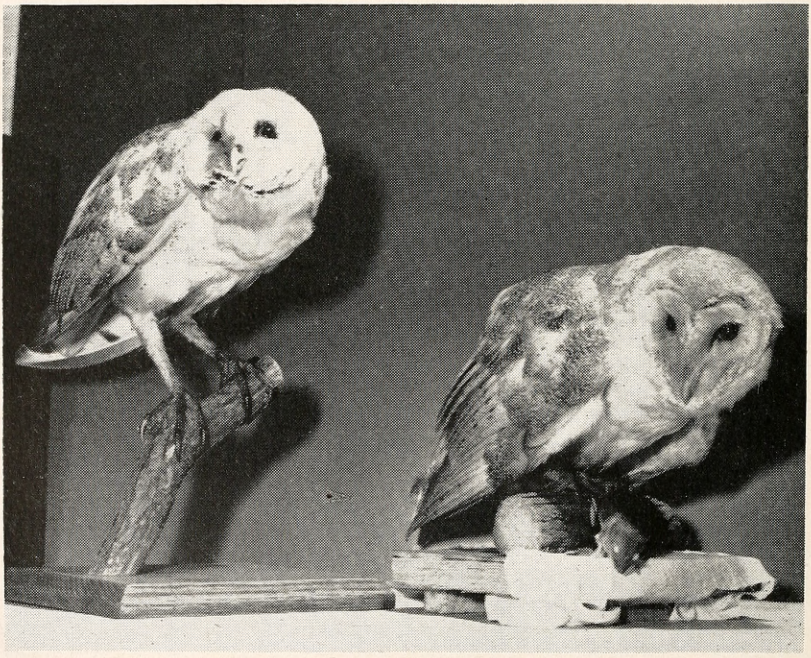
Chas. A. Leonard loaned us a timely exhibit of Chinese Art in the form of thirty-eight carved bowls and urns in January, 1942. These are exhibited in Hall V.

A nesting group of Coopers Hawk have been added to Hall VII, where also the large Eagle group has been done over.

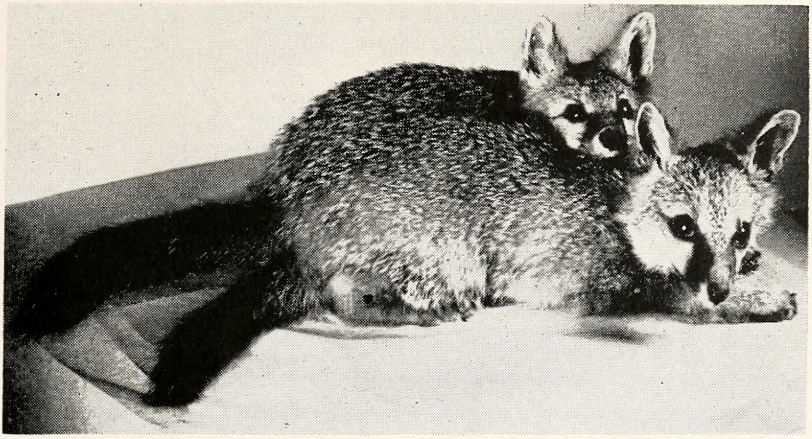
In Hall VIII the reproduction of the seven foot foetus (unborn) from the fourteen foot rare Beaked Whale has been finished and placed on exhibit. The reproduction of the mother whale is nearing completion. Ready for an exhibit in this Hall



"Onslow" the Diamond-backed rattler. An attractive live exhibit in Hall I from November, 1927 until his death in July, 1942.



Barn or monkey face owls are shown as inveterate ratters among the birds of Hall VII.



Fox Kits. From the W. Kerr Scott farm. Shown in Hall IX.

is a litter of baby gray foxes taken on Commissioner Scott's farm in Alamance County.

The insects exhibit by the Entomology Division in Hall IX has been renovated and remade. The Tobacco and Egg Exhibits, by our Marketing Division in this Hall, have been kept up to date.

PUBLICATIONS

In the new book "Birds of North Carolina" the Museum Division, with the aid of the North Carolina Bird Club and others, has brought out what is probably the finest and most useful publication that has been published under state auspices. This has been done, too, without any direct cost to the State. Indirect contributions are the materials for illustrations assembled by the Museum and those loaned by the Department of Conservation and Development. In addition, the editorial services of Messrs. C. S. and H. H. Brimley and Mrs. Roxie C. Simpson of this Department have been essentials.

Advance sales of about 2,000 copies of this volume have paid for more than one-half the printing and binding costs, and it is anticipated that other sales will pay the balance during the next year. Sales thus far have been nation-wide and in three foreign countries. All comments on the book have been commendatory without exception.

To advance our educational work, we have purchased metal printing blocks costing $120 from Houghton-Mifflin Company from bird paintings by Roger Tory Peterson. These were used in the Bird Book, along with other illustrations costing some $700, funds for the latter being contributions or from other sources.

C. S. BRIMLEY, Co-author of "Birds of North Carolina"

H. H. BRIMLEY, Co-author of "Birds of North Carolina"

We acknowledge with thanks the coöperation of the Department of Conservation, the Houghton-Mifflin Company, the Bynum Printing Company, Roger Tory Peterson, the N. C. Bird Club, and all others who have made direct and indirect contributions to this volume. Special thanks are due Dr. T. Gilbert Pearson who worked with Messrs. C. S. and H. H. Brimley as a co-author of this volume.

During the biennium we have purchased ninety-six colored lantern slides, received on indefinite loan some one hundred and twenty, and printed some sixty in our own dark room. This is valuable material to promote our educational work.

We have continued our mimeographed Information Circulars and some 40,000 copies have been distributed. Some 30,000 copies of our printed general leaflet have likewise gone to those who are interested.

ATTENDANCE

Beginning in January, 1941, we received approval for a WPA project which enables us to have an attendant in our Entrance Hall. One of her duties has been to make definite counts of visitors during her hours. For the six months January to July, 1941, such visitors numbered 67,968. For the next year of the biennium the same method gave us an attendance of 111,667,

The Museum serves the armed forces.

or an estimated total for the biennium of 247,605. To us the significance of these numbers are a challenge for a better Museum, so that these thousands might know this State even better.

The Museum had followed good practice, to the extent authorized, and kept the doors open to visitors on holidays and Saturday afternoons for several years past. In June, 1941, the matter of "what to do and where to go" for visiting Service Men from our military posts became an acute problem for Raleigh and the State. At the Director's suggestion, the Defense Council asked for and received authorization from Governor Broughton to open the Museum on Sunday afternoons. For fifty-two Sundays ending July, 1942, we counted 16,172 interested visitors. As much as 20% of these have been Service Men, including the highest type of young citizens from all sections of the Nation. This is a real State Advertising opportunity.

In summary, we conclude that the restrictions on travel have reduced our total attendance, especially for school groups, but the personnel and number of attendance still offers a challenge.

COOPERATIVE WORK

War conditions made necessary the closing of the State-wide WPA Archaeological Project. We worked with the University and others to close this in an orderly manner and to conserve the valuable material and information that had been gathered. All work on this was suspended in June, 1942, for the duration.

The N. C. Art Society moved its collection of paintings from our Hall V early in the biennium, giving us some needed space.

The WPA Museum's Project is noted under Attendance. In this, as in other ways, we work closely with the Hall of History (N. C. Historical Museum) to our mutual advantage. Not only has this project allowed us an attendant to meet and count visitors, we have had unskilled help to clean and do general work, thus releasing some time for our regular janitor to do skilled work that we have no budget provision for. Most important is the fact that the WPA workers have enabled us to open our doors to visitors on Sunday afternoons in spite of the fact that our budget makes no provision for the extra work involved.

Under Field Work, the aid of the Academy of Sciences and the American Philosophical Society was acknowledged. Under Accessions the aid of the U. S. Geological Survey was acknowledged in supplying material for strategic mineral exhibits. Under Publications the aid of the Department of Conservation and the Bird Club and its members was acknowledged. About five hundred dollars was contributed by the latter when this became essential for the proper illustrations for the new "Birds of North Carolina."

Following our policy of aiding other Museum and teaching projects in the State, we contributed a group of mounted fishes

and waterfowl to Eastern Carolina Teachers College in November, 1940. In May, 1940, we gave Mars Hill College a group of mounted birds, and in April, 1942, we gave a group of mounted birds and fishes to the Art Department of the University. To State College we have given reptiles and an elephant skull. In the course of the biennium, we have donated to the Historical Commission a large Civil War shell, from near Williamston, and a set of wood-working tools that were used in the construction of the State Capitol, along with other lesser items.

PERSONNEL

What accomplishment we have to report is the result of the earnest efforts of our small (for a museum of this size) staff. Often they work under handicaps and without the best tools. Miss Patty Pittman left us in June, 1942, for a much better salary at the University of Iowa. Miss Mary Knight, veteran secretary of the Department, has replaced Miss Pittman and her knowledge and experience will be invaluable in the many services the Museum is called upon to render.

Mrs. Roxie Collie Simpson has continued with our Taxidermy work, and general zoology, and has gone beyond her regular hours in working with the copy and illustrations for the new "Bird Book." I have recommended that she be classified as Junior Curator of Zoology.

H. H. Brimley has likewise continued his good work on the "Bird Book," on our general zoology, and he has done fine work in the reproduction of the Beaked whales. His career since 1884 has been related directly to the Natural History of North Carolina. We feel fortunate to have him continue with us.

Withal, we have a loyal group who are vitally interested in the good work our Museum can do. They coöperate heartily whether it is extra hours on Sunday, or extra hours to package and mail out 2,000 "Bird Books." Our three WPA workers show this same interest and loyalty.

In addition, we should give credit to volunteer workers who have aided the Museum. Miss Mary Burgess, a University graduate in geology from Spruce Pine, worked for three months here, beginning in September, 1940, on our geological exhibits. This was a valuable service. Allan Midgette, Swan Quarter student at State College, gave us valuable aid in photographic work over a period of several months. Leon Hayes of Greensboro gave us two weeks of valuable work in June, 1942, and Miss Elizabeth Varner gave her clerical services most of June, 1942, in connection with getting out the new "Bird Book."

BUILDING

Governor Broughton, Commissioner Scott, and members of the State Legislature of 1941, recognized the hazardous condition of the old building housing the Museum. The Legislature

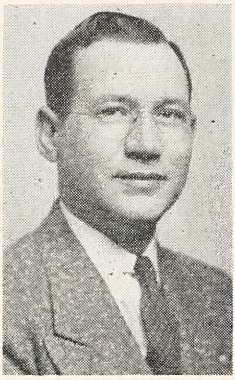
authorized a committee looking towards improved housing for this and other State agencies. War conditions have dictated the postponement of definite action on this.

Some improved lighting has been installed in the old building and other lights are on hand to be installed.

Our fire extinguishers have been recharged and placed where indicated, and the Director has followed closely the plans of the Office of Civilian Defense for the protection of this building and its contents against war hazards.

It is a matter of interest that a recent inventory shows that we have in this building cases and exhibits worth some $174,000. This has been cumulative over many years and notwithstanding the fact that most of our cases are forty to fifty years old. The inventory values were based upon conservative replacement values, although many of the exhibits cannot be replaced.

In coöperation with the salvage program for the War Effort accumulated minerals and metals that have no Museum value are being placed into productive channels, and a detailed accounting of this is being made to the Commissioner.



Louis H. Wilson

PUBLICATIONS

LOUIS H. WILSON

Services of the divisions comprising the State Department of Agriculture have been more effective because of the dissemination of news stories through the press and other information through the various official publications during the biennium.

The regulatory, inspectional and control laws have been made effective through the publication of violations and regular reports of services have resulted in the creation of greater understanding and appreciation of the work of various divisions having programs designed to protect the consumer as well as the honest manufacturer.

The press in general has been coöperative in promotion of agricultural information released by the Department and a conscientious effort has been made to place emphasis on the quality rather than the quantity of news offered for dissemination and publication.

Agricultural Review: This is the bi-monthly publication issued by the Department and is sent to more than 30,000 farmers, farm families and others without cost. It is regarded as the voice of the Department. *The Review* contains summaries of regulatory, inspectional and control programs and is used to keep the public informed as to services offered and rendered.

Particularly significant information is contained in tables showing low analysis and incorrectly labeled feeds, adulterated and mislabeled foods and mislabeled seeds.

One of the most appreciated features of the publication is the "Tar Heel Farm Wants" section, which is used as a marketing service for farmers and affiliated interests. Thousands of dollars worth of farm produce, and related products are sold, exchanged or bought through the medium of advertising which is provided as a free service.

Bulletins: Greater emphasis has been placed on articles, indexing and illustrations for the quarterly bulletin of the Department and other agricultural divisions which has made it possible to present information to the farmer that has been valuable and appreciated.

Illustrations: The division maintains a useful and appreciated picture service which has been used extensively by the newspapers and press associations. News pictures or mats have been furnished the press with regularity and the general acceptance

of this service has enabled the Department to better inform the public of its activities and programs.

Information: Requests for information on all phases of agriculture are handled promptly by the publications division. In instances where the information cannot be supplied by the Department, requests are referred to the proper agricultural agencies and the individual is informed as to what action has been taken.

Publications of the State Department of Agriculture.

Newspapers: News stories have been furnished with regularity both to the daily and weekly newspapers of the State and special feature stories of seasonal importance have been extensively used. Adequate illustrations have accompanied most feature news stories.

Press Associations: Press associations serving the daily newspapers, principally the Associated Press, United Press and the Association of Afternoon Dailies have rendered notable services to the agricultural life of the State.

All associations have been furnished current news promptly and the readers of the daily press have been kept informed with regularity of the services offered and performed by the 16 divisions of the Department.

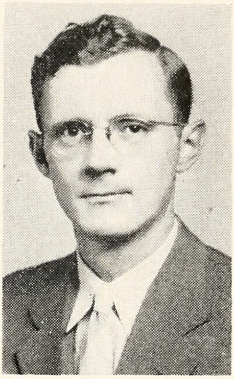
In addition to the regular coverage of news in the Department, the Associated Press handles a weekly farm page feature, prepared by the publications division, in connection with the services of the Department.

Radio: The news stories released by the Department are usually made available to the radio stations by the press associations, but numerous special radio stories have been prepared upon request.

State Fair: The agricultural, educational and industrial features of the Great State Fair for 1940 and 1941 have been given wide publicity by the newspapers and press associations operating in North Carolina. The press in general has contributed substantially to the educational and financial successes of the expositions. Editorial writers in the State, in particular, have made outstanding contributions promoting the fair as an educational institution.

Seed Laboratory

J. W. Woodside



J. W. Woodside

A total of 26,038 samples of seed was tested by the Seed Laboratory during the period from July 1, 1940 to June 30, 1942. This represents an increase of 9% over the previous biennium which was a high up to that time.

The duties of this division are to enforce the state seed law and to make tests and analyses on seed for farmers and seed dealers within the state in order that they may properly label the seed that they have for sale.

During the past two years a special effort has been made to raise the quality of seed offered for sale to farmers for seeding purposes. Seed dealers have coöperated at all times. In coöperation with the Division of Markets, grades and standards for lespedeza seed were recommended to the Board of Agriculture and adopted. These standards are widely used by processors and dealers in lespedeza seed. A recent study of

An automatic counter (shown in the left hand of the seed analyst above) is used to speed-up the testing of seed. Attached to the counter is a suction hose employed to "draw" fifty seeds (watermelon in this case) which are placed on moist blotters where they "grow" or germinate, revealing the good and bad seed.

the lespedeza seed offered for sale showed that 26% more of the Korean lespedeza and 14% more of the Kobe was of N. C. grade 1 quality than was in that grade before these standards were adopted.

Parties who operate seed cleaning machinery have been contacted and given information which enables them to do a better job. As a result of this program the Board of Agriculture on June 26, 1941 reduced the amount of dodder that could be in seed offered for sale from 5,000 per pound to 2,500 per pound and reduced the amount of noxious weeds permitted in small grain for seeding purposes from 200 per pound to 100 per pound.

This biennium is the first full two year period in which we have had a Federal Seed Act. In October 1940 a memorandum of understanding was signed by the Commissioner and the Agricultural Marketing Service of the United States Department of Agriculture concerning the enforcement of

Seeds are placed in temperature-controlled germinators in the process of determining how many will grow.

the Federal Seed Act in North Carolina. Under this agreement seed inspectors of the North Carolina Department of Agriculture are licensed to sample seed that has moved in interstate commerce for the Federal agency. This procedure simplifies the enforcement of seed legislation on seed that has moved across a state line without additional cost to either the Federal or State agency. One of the first convictions obtained in the United States under the Federal Seed Act was based on evidence furnished by this division.

The 1941 Legislature brought the state seed law up to date by enacting an act which was patterned after the recommended state seed law. This act works well with the Federal Seed Act, a feature much desired in state seed legislation.

The question of the authority of the state to collect the inspection tax on seed and to stop the sale of seed that does not meet the guarantee of the label has been challenged by the Federal Government through the Agricultural Adjustment Administration. During April and May, 1942 peanuts and soy bean seed were distributed to farmers by the Agricultural Adjustment Administration. The soy beans were not labeled and all of the peanuts carried identical labels. The state inspection tax of one cent per bag had not been paid on any of this seed. After the sale had been stopped on several lots of this seed a Federal restraining order was served on the Commissioner restraining him from interfering further with these sales. Inspectors were instructed to continue to sample the seed and germination tests showed that all of the peanuts were of very poor quality. Field results verified the laboratory tests. Farmers found it necessary to plow up large acres of these peanuts, losing seed and labor of planting. Locally grown peanuts in practically all cases produced satisfactory results on these farms. A germination guarantee of 88% was made on these peanuts. The Seed Laboratory found them to range from 37% to 62%, the average being 47.5%.

The soy beans distributed under this program produced satisfactory field results, but the company who sold these soy beans to the Agricultural Adjustment Administration in this state first had them tested in the Seed Laboratory and delivered only those lots germinating 85% and higher. The Department of Agriculture received no revenue for this service because these soy beans were distributed without inspection tags.

The loss of the farmers who bought these peanuts for planting illustrates what may happen at any time a large volume of seed is exempted from laws that have been enacted to protect the purchasers of such products.

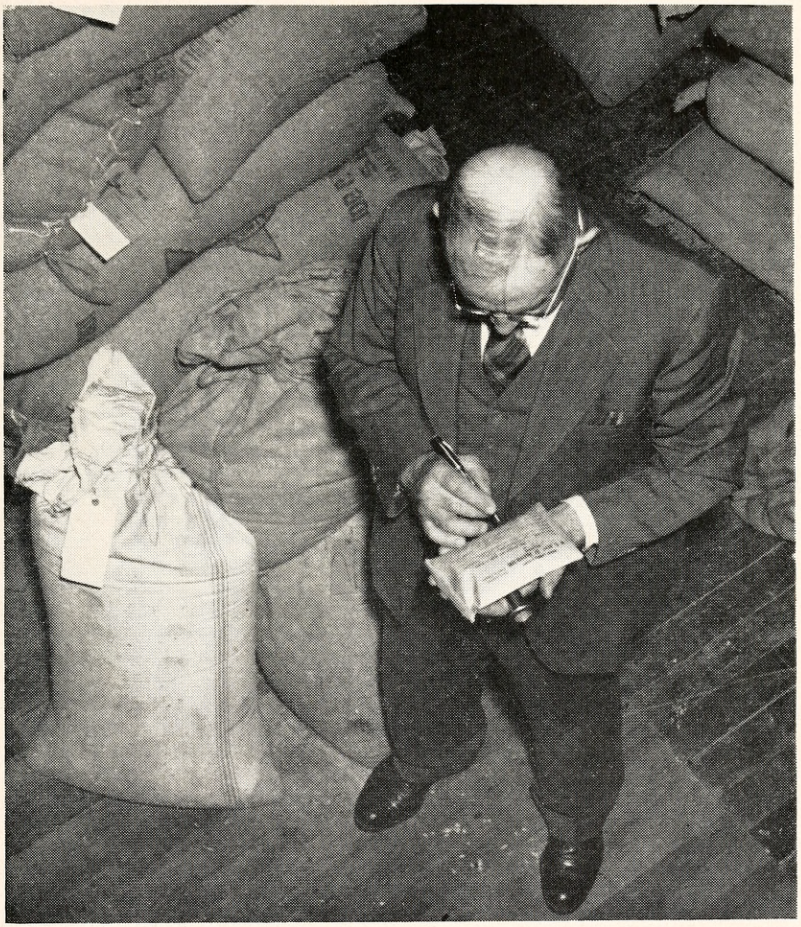
During the biennium seed inspectors issued 188 stop sale orders on seed that were being offered for sale in violation of the seed law. These orders covered 226 lots of seed including 9,402 bags. The object of this program is to insure the farmer that he is getting the quality of seed that the label

A seed inspector is shown drawing a sample at a dealer's store. Using a probe (the metal device held in the inspector's right hand), representative samples of seed for testing are secured.

indicates. A good example of the operation of this program was the party who was restrained from selling 15,000 pounds of lespedeza, just as it came from the combine, that was found to contain only 40% lespedeza seed. This party was selling this seed for eleven cents per pound when clean seed of this same variety was retailing for fourteen cents per pound. This action alone saved farmers about eight hundred dollars ($800.00) and insured them of a much better chance of get-

ting a stand of lespedeza that would produce salable hay or seed.

In most cases seed that has been withdrawn from sale is placed on sale again after it has been recleaned and labeled, but some of this seed was of such poor quality that it was advisable to order that it be utilized for purposes other than seed.



Accurate information on each seed sample taken is recorded by the inspector on the sample bag sent to the Seed Laboratory.

In twenty-one cases after apparent violations, the party responsible for labeling the seed was called for a hearing concerning the alleged violation. In all cases an attorney from the Attorney General's office participated in these hearings. Representatives of five wholesale vegetable seed dealers were

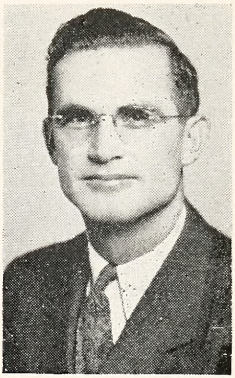
cited for a hearing concerning the quality of vegetable seed sold in this state during the 1941 season. The quality of the seed shipped into the state by these five dealers during the 1942 season was materially improved.

STATISTICAL REPORT

	1940-41	1941-42
Official Samples Tested	973	1,667
Samples from Individuals	11,424	11,974
Total Samples for the Biennium		26,038

Soil Testing Division

Dr. I. E. Miles



Dr. I. E. Miles

During the year 1940-41 there was a tremendous increase in the work. About 15,000 samples were analyzed. There was every indication that the next year would be as large or larger. However, with the coming of the War and the shortage of certain fertilizer materials, the farmers became apprehensive and purchased their fertilizers much earlier than usual. In many instances, they purchased not what was considered best, but whatever could be had. Under these circumstances, many people felt that there was no particular point in having their soils tested. About 10,000 samples were tested during 1941-42. Actually there is more reason for testing the soils under a scarcity of fertilizer materials than ever before because it would enable one to use his fertilizer and lime more efficiently. However, it does mean that one should have his soils tested early so that he can get the results of the test and buy his fertilizers early.

The Soil Testing Division has been useful in the war program in analyzing soils from new air bases and fields located at various points in North Carolina. It is essential in these airports that sod be established for landing fields and runways and that it be established quickly and properly. In many instances, surface soil has been removed in leveling, and unusual soil conditions present themselves. Questions arise as to what surface soil should be saved and used and what should be disposed of. Samples have been submitted to this laboratory frequently. Analyses are made and recommendations made for proper fertilization, liming and handling of these areas for establishment of a satisfactory sod.

Laboratory

The Laboratory has been further improved during the last two years and is now well equipped. It has been designed and equipped for soil testing exclusively and therefore has a number of advantages over an ordinary chemical laboratory.

A paper entitled "Soil Testing Methods and Apparatus Designed for Economy in Time and Labor" was presented before the American Association for the Advancement of Science in Philadelphia, Pa. and was published in the *Journal of The American Society of Agronomy*. The paper was well received.

The major portion of the routine soil testing work is done in about four months of the year. The samples are usually submitted

just before the fertilizer is to be purchased. Therefore, it is very desirable to complete the work and give the farmer a report and fertilizer recommendations just as promptly as possible. The equipment has been designed to this end.

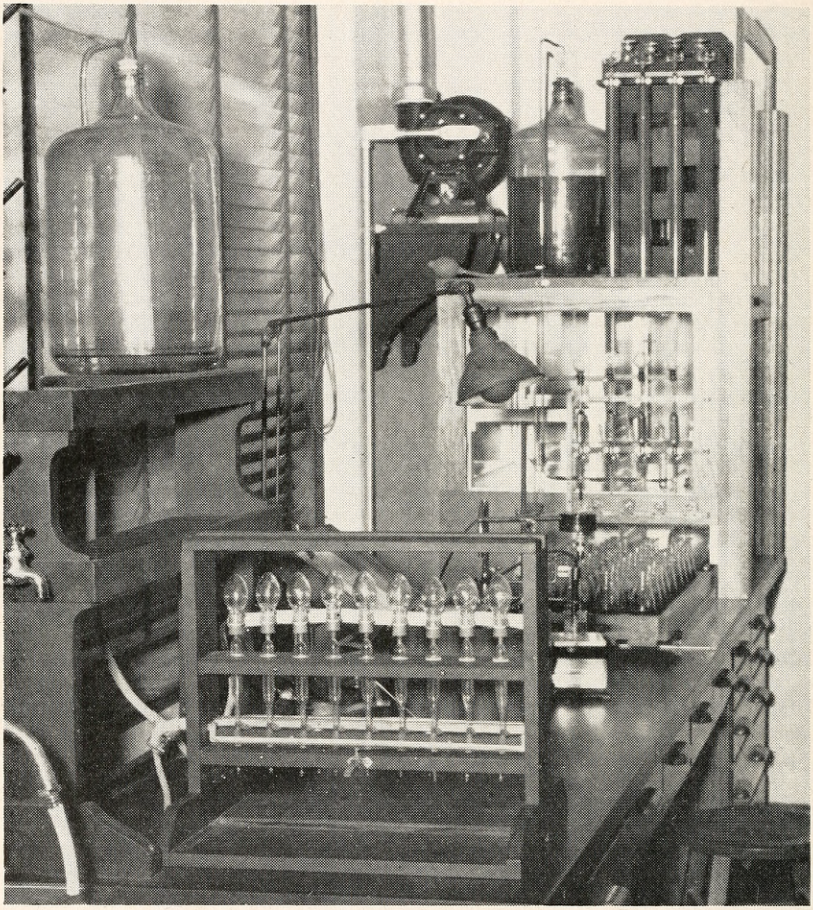


Figure 1.

Figure 1 will serve to illustrate this point. The solution used to extract the plant food ordinarily would be added by means of an automatic pipette which requires separate manipulation for each sample. With the piece of equipment shown in the foreground of the picture the solution is added to nine samples simultaneously by merely compressing one lever. This piece of equipment is typical of others which have been designed and made here specifically for this type of work. Such equipment can save a great deal of time and therefore speed up the work

tremendously. This is essential if the samples are to be handled quickly and yet thoroughly and efficiently. There are, however, further improvements and equipment which will be designed and secured when equipment is available again.

EDUCATION

There is no doubt that soil testing has often been used improperly and perhaps in some instances tragically. People have used it who had very little understanding of the fundamentals of soils, crops and plant nutrients. Soils have been tested by those who did not understand the methods and their limitations. Under such circumstances, interpretation and recommendations were naturally erratic.

The public has, in some instances, been oversold on soil testing. This certainly is no condemnation of the service, because it has and can make a great contribution to our farming program.

In some soils and for certain crops the application of a single fertilizer material has produced as good yields as a complete fertilizer mixture. On the other hand, the application of a single plant food may actually accentuate a deficiency of other plant foods. This is shown in Figure 2. Corn grown on this soil needed potash. The farmer applied lime. It is in worse condition than it would have been had nothing been done. There are innumerable instances where unbalanced fertilizers are used for the soils and crops concerned. This often serves to aggravate a situation which was already very bad. Furthermore, fertilizers are utilized most

Figure 2.

efficiently only when the lime status is within a certain range. In addition to the efficiency of the fertilizer itself under the proper lime status, the various crops have a place within the lime range where they do best. Some crops are quite tolerant of variations within the lime status while other crops are very specific. Therefore, proper liming itself is very important. This

Figure 3.

Figure 4.

is shown in Figures 3 and 4. Figure 3 shows the corn growth in a good soil which is extremely low in lime and therefore is extremely acid. Figure 4 shows the corn growth in a good soil when the lime status is correct.

This educational program certainly is not limited to the field of soil testing, but is a problem of all farm leaders who are concerned with crop production. It is obvious, however, that the Soil Testing Division will make its greatest contribution only as the general educational program succeeds.

In connection with the educational program, the Division furnished speakers and kodachrome slides to many farmers' meetings. The meetings all were sponsored and arranged by representatives of the Extension Division, the Vocational and Agricultural teachers, Farm Security Administration, Soil Conservation Service, fertilizer companies and the Grange. Through these meetings and extensive visitation on the part of the agronomists with the farmers, considerable progress is being made. The visits in which the agronomist with the farmer looks over the crops during the growing season are very helpful. It gives the agronomist an opportunity to point out the plant food deficiency symptoms, inconsistent practices, etc. The visit also serves to keep the agronomist informed firsthand as to the needs of the farmers. Furthermore, these visits serve to promote interest in problems which are common to both and therefore give a better general understanding.

FOLLOW-UP WORK

Soil testing agronomists realize that there are tremendous variations from soil to soil. They know that plants vary a great deal in their aggressiveness and feeding habits and in the demands that the crops make of the soil. They also realize that climatic conditions are potent factors in the growth of crops. In view of these forestated facts, the agronomist is always interested in following his recommendations through in the field where they are subjected to these agencies. The results of these visits serve as a basis for future research and improvements in soil testing methods and procedures. It naturally serves an educational function also.

TROUBLE SHOOTING

Every year there are a great many people who have trouble with their crops. The area involved may not be very large and it may be caused by disease, plant food deficiencies or it may be due to climatic conditions. Regardless of the cause, if the damage is great, the farmer wants to know the trouble and is entitled to assistance in locating it. It is commendable that he recognizes the fact that he has a problem and wants to correct it.

In most instances one of the soil testing agronomists arranges to visit the farmer having trouble. Usually a number of farmers

are visited on each trip. The local agricultural agency is usually contacted and carried along to the farm. Many times the trouble can be identified in the field, but usually soil samples are collected and brought to the laboratory. After the soils are analyzed, the farmer is advised as to the findings and liming and fertilizer recommendations made. If there seems to be a disease problem involved, specimens of the crop are also collected and delivered to the Extension Pathologist.

Considerable assistance is rendered through this medium and it also serves an educational function.

STAFF

The work has grown materially during the past two years and quite naturally the staff has to be increased. The permanent personnel includes the director, an additional agronomist, two soil chemists, one laboratory aide and two secretaries. During the peak of the work two additional chemists, two additional laboratory aides and two or three additional stenographers are usually employed. Heretofore, it has been possible to borrow one or two chemists from the Chemistry Division. After the peak of the work was over, one of the soil chemists was usually able to help the Chemistry Division and therefore the work was somewhat balanced off between the two divisions. However, the peak of work in the two divisions is approaching each other more closely each year. If this continues, it may become impossible for these arrangements to continue.

FINANCIAL REPORT

The expenditures may be listed as follows:

	1940-41	1941-42
Salaries	$ 9,460.34	$13,755.22
Supplies	413.79	1,003.97
Postage, Telegrams, Telephone	416.57	414.27
Travel	1,404.28	1,528.14
Printing Forms	46.48	42.72
Scientific Supplies	1,488.59	
Laboratory Equipment	740.50	731.37
Office Equipment	411.07	
Employees' Contributions to Retirement System		483.60
Soil Sample Containers		765.66
TOTAL	$14,381.62	$18,241.35

ACKNOWLEDGMENT

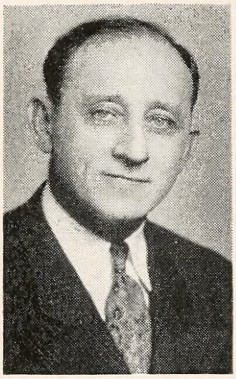
The soil testing program would have been doomed to failure if it had not had the coöperation of other agricultural agencies. Very few farmers could have been contacted personally by the employees of the Division.

Since the soil testing field is relatively new, it naturally will be making quite a few changes as research progresses in this field. This is indispensable and has been realized from the begin-

ning. Therefore, every effort has been made to coöperate with the Experiment Station. They have already rendered invaluable assistance, but the outlook for the work in the future is even brighter. The soil testing agronomists are now members of the Experiment Station staff and are therefore very definitely tied into the research program. This is considered a very progressive step and should prove helpful to all concerned.

The same spirit of coöperation and general helpfulness has been characteristic of the other agricultural agencies. The vocational agricultural teachers and representatives of the fertilizer industries have been particularly helpful from the very beginning. More recently the County Farm Agents, Farm Security Administration and Soil Conservation Service have manifested considerable interest in the program and therefore have also been very helpful. It is the purpose of the Division to serve the farmers and to be helpful to all other agencies which have the same purpose.

The Soil Testing Division is indebted to all those mentioned above and to any others who have assisted it in making the program helpful to the farmers.



Dr. J. S. Dorton

State Fair

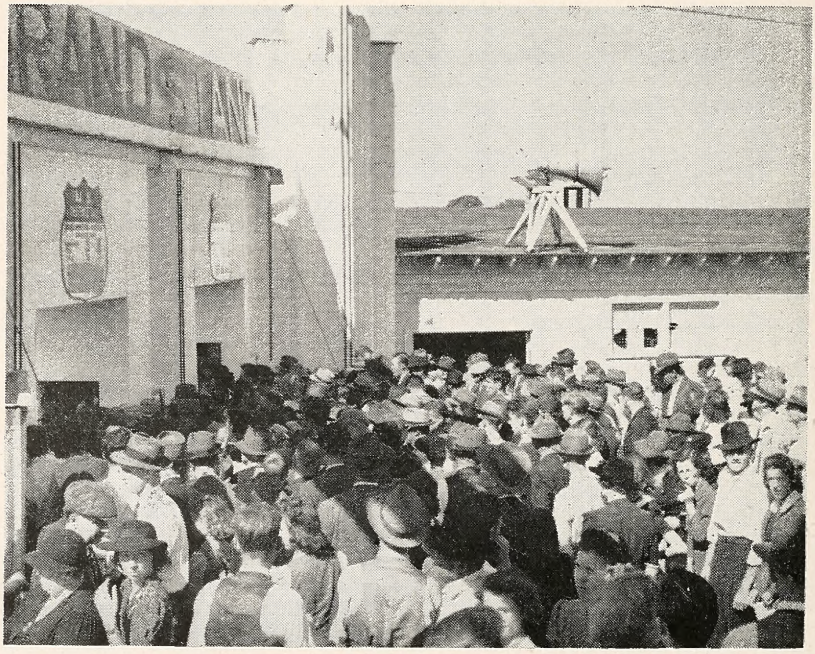
Dr. J. S. Dorton

The North Carolina Great State Fairs of 1940 and 1941 have been operated successfully from both an educational and financial standpoint.

Substantial increases in premiums paid to exhibitors have been made each year since the State Board of Agriculture assumed responsibility for operation of the exposition in 1937.

A record-breaking crowd of approximately 235,000 people attended the 1941 State Fair and 92,000 square feet of exhibit space was devoted to agricultural, industrial and educational displays, in addition to 25,000 square feet provided under two tents for the livestock interests of North Carolina.

The fact that two tents had to be utilized for housing livestock exhibits emphasizes the need for enlarged exhibition facilities and both rural and urban leaders throughout North Caro-



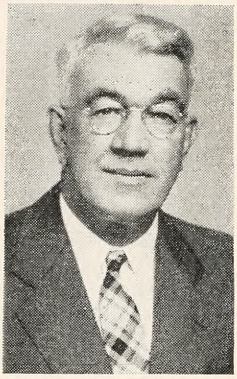
Record crowds have attended the State Fair since 1937.

lina have joined the management in an appeal for support of a building program that would place even greater emphasis on educational displays. However, recognizing the prevailing war conditions and difficulties in securing adequate facilities, the proposed building campaign has been deferred for the duration.

The 1940 and 1941 State Fairs have been representative of virtually every Federal and State agency in North Carolina and the educational and financial successes attest the fine coöperation and spirit of appreciation enjoyed in the planning and presentation of each exposition.

Although great stress has been placed on the educational features of each fair, the entertainment programs have not been neglected. A well-balanced entertainment program is essential for a well-balanced exposition and attractions presented during the past two expositions have brought favorable comment from both newspapers and radio stations, as well as the general public.

North Carolina's first egg show exhibit.



Frank Parker

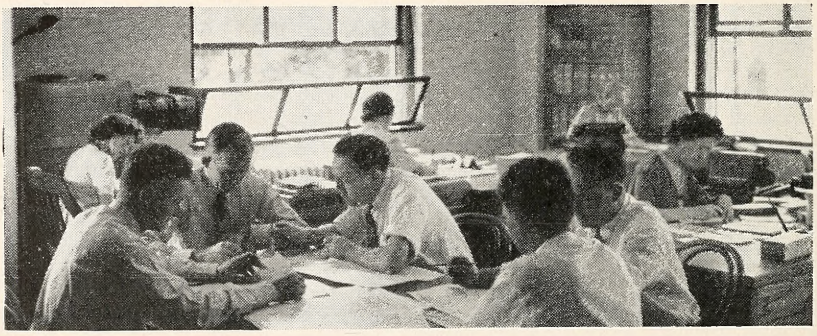
Division of Statistics

Frank Parker

After 23 years of coöperative relations and 26 years under the direction of the present statistician, the results of the Crop Reporting Service have come to be taken for granted and are being utilized by all agricultural agencies. It is the official source of statistical information. Its reliability has long been established and its value well known.

Because of the basic statistics available, when the farm relief program was initiated in 1933, North Carolina was well prepared for this program not only through the data available but through the farmers' thinking for themselves. Again when the national defense efforts were required in the fall of 1941, North Carolina was prepared with county statistics. The agricultural leaders and farmers themselves were accustomed to thinking in terms of agricultural statistics. They have come to know that in cases of doubt about a farmer's basic allotment, the matter may be cleared by applying to the State Statistician's office for records secured during the base years affected. This information is accepted by all parties concerned. Such information is available in no other Southern state.

With the advent of the Statistical Laboratory at State College which was encouraged by the Crop Reporting Service and has been established during the past two years, North Carolina has taken a distinct lift in the estimation of other

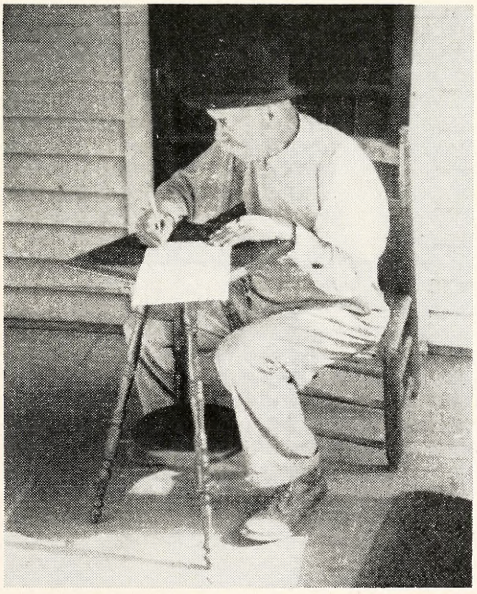


On report days the technical men of the Crop Reporting Service assemble around a long table with their large statistical summary sheets, correlation cross-section charts, weighted averages and other data. Each man independently determines his estimate of each item. From these individual estimates, the statistician in charge then recommends a figure to the National Crop Reporting Board. The clerks in the background steadily provide new working material for the technical men.

states interested in statistical work. Already this State ranks with Iowa in the advanced nature of its statistical development and research opportunities for advancement. This is indeed fortunate not only for the Department's Statistics office, but to all agencies in North Carolina. On the other hand, it is fortunate for the Statistical Laboratory that the foundational work had been developed to the extent it had before this new State College department was initiated in 1941.

FARM CENSUS

Of particular interest is the effort and aid provided to the war emergency program. The long established county estimates and experiences for providing such enabled this State to promptly provide in a dependable way the county statistics basic to the war program. Of particular value to this was the State's annual Farm Census Survey. Here again, the extra effort put forth in December 1941 toward securing more dependable and expanded Farm Census results was most fortunate. The final county summaries, distributed in August 1942, showed that about 95 per cent of all the farms were actually reported and the results were unusually good.



A Wake County reporter "fills out" a crop schedule at his farm home. The Crop Reporting Service has available thousands of such voluntary farmer aids.

As with so many other agencies, the drain of technically trained men from the Crop Reporting Service has had a telling effect. Unfortunately, women are not trained in this technical

work and these men will be replaced with considerable difficulty if at all.

NEW FEATURES OF WORK OR SERVICES

Expanded commercial truck crop reports.
Statistical Laboratory and research.
National Defense work.
County war goals.
Farm census expansion.
Field sample counts with tobacco, peanuts and potatoes.
Expanded federal relations of the Bureau of Agricultural Economics privileges and surveys.
Farm labor and relations with the Employment Service.
Threshers—fall threshed crops and doubled other reports.
Commercial poultry and related information.
Dairy manufacture statistics.
New Applications of the Rural Carrier surveys.
Statistical research efforts.

As a means of improving tobacco yield estimates, tobacco field counts are being studied. Mr. J. J. Morgan, Agricultural Statistician, is shown measuring the width and length of tobacco leaves, which, with number of leaves per plant and width between rows, are used in figuring the yield. Similar cotton counts have proven to be good.

SCHEDULE OF REPORT RELEASES BY MONTHS:

The schedule of official (United States) statistical report releases for 1942 covers eight closely typed pages, which explains (1) why they are not shown here, (2) the great scope of services available, (3) the recognized importance of agricultural statistics in today's program and educational work and (4) that agriculture is indeed a very broad subject—so much more than anyone realizes until he studies it in detail for many months.

Cotton estimates require considerable time and close attention. Monthly growing conditions, probable yield, boll weevil and natural damage, progress of picking, ginnings, and sales must all be determined. Farmers themselves too seldom know the real conditions inside their cotton bolls.

On July 10, the following reports were released. A single day's report releases are given in order to illustrate the extent of the official national scope:

1. Stocks of corn for grain, wheat, and oats on farms on July 1.
2. Planted acreage of corn, spring wheat, oats, barley, flaxseed, potatoes, dry edible beans, and sugar beets.
3. Acreage for harvest, indicated yield per acre as of July 1, and indicated production of corn, winter wheat, spring wheat, oats, barley, rye, flaxseed, rice, hay, potatoes, sweet potatoes, tobacco, sugar beets, sugarcane for sugar and seed, dry edible beans, and hops.
4. Acreage of soybeans, cowpeas, velvet beans, sugarcane for syrup, sorghum for syrup.
5. Acreage and condition of peanuts.
6. Condition and indicated production of peaches, pears, grapes, cherries, and miscellaneous fruits and nuts.

7. Condition of apples (commercial), pasture, and citrus fruits.
8. Production of milk per cow.
9. Production of eggs per 100 hens.
10. Indicated production of citrus fruits (1941-42 crop).

Interplanted crops are a problem as to acreage for harvest, how to be harvested, yields, etc. A large percentage of corn, North Carolina's largest crop, is interplanted with legumes.

THE PRIMARY FEATURES OF STATISTICAL SERVICE WORK INCLUDE:

A. Compliance of State Acts.
   1. Farm Census.
   2. Threshers' records.
   3. Tobacco warehouse sales.
   4. Dairy Manufacturers.

B. Mailing lists maintained (63) Voluntary Reporters and Agricultural Leaders.

1. For schedules	copies sent	33,161
2. For reports, etc.	copies sent	17,148

C. Preparation and handling of report schedules.

1. Number schedules mailed	420,593
2. Schedules tabulated	109,892
3. General and regular reports compiled	(about) 150
4. Special and irregular reports	(about) 175
5. Letters (mimeographed) mailed	91,857
6. Miles traveled by technical men	35,949
7. Hours worked:	
a. Regular crop estimates	38,076
b. Farm Census, labor, etc.	20,318
Total hours worked	58,394

D. Releases.
   1. Mailed copies of reports released 247,100
   2. Number "Agricultural Situation," "Agricultural Statistics" and other printed publications mailed 82,778
   3. Special stories for the newspapers 102

E. Special Request Services.
   1. By mail 915
   2. By telephone or telegram 586
   3. Personal 527

F. Special statistical projects and research.

G. War purposes activities.

H. Field investigations work—travel entire state.

I. Business matters and correspondence.

STATISTICS' PLACE IN AGRICULTURE

Altogether, the Agricultural Statistics Division and the Crop Reporting Service have made steadily great strides since 1919, and the future should be a continuation. As a matter of fact, under the war effort there is the greatest need of statistical information. Perhaps an even greater need will be during that reconstruction and readjustment period following the war.

While the statistical services may not appear as effective or interesting as some other of our personalized services, it is, as with other educational information and agencies, basic to effective planning for constructive work. Thus, it is a working tool to other ends. It may be likened to a banking clearing house of information. It is from this office that other agricultural agencies can provide their most effective program work.

SCOPE OF SERVICES

The following explanation is given for the Coöperative Crop Reporting Service embracing both the Statistical Division and the State Statistical office of the United States Bureau of Agricultural Economics. This is a coöperative relation for serving North Carolina and there are no distinct lines of demarcation. In this setup, the State provides about one-third and the United States about two-thirds of the coöperative funds. These coöperative relations have existed since early in 1919.

A better idea of the work may be gained from the fact that the cycle, like farming, is one year long. That is, before a repetition of reports occurs, a year has passed. Thus, it requires several years to really become acquainted with the entire functions of the office. Technically trained men in agricultural statistics have been found most essential and even these require several years to become proficient.

CROP REPORTERS

In order to secure the 366 reports yearly, many lists of voluntary reporters are required, totaling more than 10,000 aides coöperating through more than 66 different lists of specialized reporters. Since this office collects original information, it is necessary not only to have these reporters, but to prepare schedules and mail to growers to fill out and return. Something like 700,000 envelopes were used during the past year which indicates the enormous routine mailing task. In fact, only one with considerable experience in statistical work can remotely appreciate the task involved. For example, to maintain the proper spirit and morale among the reporters, news service sheets have been found important. Printed publications, news releases and other compensating services are required.

The mail room of the Crop Reporting Service has modern equipment for addressing envelopes from plates; mimeographing schedules, letters and releases; folding and sealing. Approximately 1,000,000 sheets of paper and 800,000 envelopes will be used for 1942 reports. About 30,000 reporters are on the mailing list. Except on rush days, one clerk handles this work.

Obviously, certain business matters are required in addition to the usual correspondence. These include statistical matters for both the federal and state agencies. The more than 60 files, two storage rooms, large current supplies and vast records covering the past 25 years which increasingly become valuable as reference material.

The State Acts work, which belongs principally to the State Department of Agriculture and its Statistics Division, includes the Farm Census annual survey, tobacco warehouse sales, threshers' records and dairy manufacturers products report. The Farm Census alone represents this year something like 250,000 different farm reports.

The special projects maintained have been the farm labor surveys, county estimates for the A.A.A. and war goal purposes, coöperative relations with the Statistical Laboratory and Research project, as well as other related special efforts.

In crop estimating work it is important to observe the same farms at regular intervals. The Department's Test Farms offer ideal opportunities, especially as their superintendents are quite coöperative. Above is a view looking west on the Piedmont Test Farm with Mr. J. W. Hendricks examining an alfalfa field.

THE ESSENTIAL OR BASIC REPORTS

These cover practically farm-wide scope and include:

1. Regular official estimates or forecasts.
2. Prices farmers receive and pay.
3. County farm statistics for program planning.
4. Special crop features and economic reports.
5. Report releases on important agricultural features.
6. Publications, printed for permanent usages.

Explanation: The regular and official crop report estimates have been issued for the United States as a whole since 1866 and by states since about 1900. The first State office was established about 1912 under the direction of Professor W. A. Withers of State College. The work was reorganized into its present form in 1914. The coöperative State office was established in May 1919, when the county estimates were initiated and the first printed State publication prepared.

LONG-TIME SERVICES:

The following is a list of the long established features of this service which are considered now as established or regular features:

1. Regular monthly general crop report.
2. State Farm Census through County Commissioners.
3. Threshers' records of county operations of 9 crops.
4. Monthly tobacco warehouse sales, 1907.
5. Various livestock reports, 1900.
6. Monthly prices farmers receive, and index numbers, 1919.
7. County estimates of major crops, 1919.
8. Cotton field counts for estimating yields, 1923.
9. Rural carrier surveys, 1924.
10. Crop meter reports, 1922.

Special or periodic reports on various features were established prior to 1920. All of the above make up the basic information for the acreage, yield, production, price and value data for our annual publication.

SPECIAL SERVICES

1. Individual or special requests.
2. War efforts.
3. News Releases.
4. Crop and livestock revisions.
5. National Defense work.

Explanation: These are largely self-explanatory and include some of the features noted below under new features of work. Altogether, the special services make up about one-third of the work of the office. It is these services that usually get the best response since the well-established or long-time services are taken for granted and are not so noticeable.

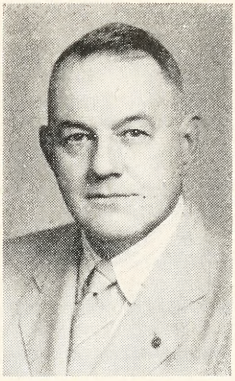
NEW FEATURES—SERVICE ACTIVITIES

1. War Board activities, U.S.D.A. agencies.
2. Farm labor surveys and studies.
3. Statistical Laboratory activities (State College).
4. Grain storage surveys.
5. Farm Census expansion.
6. Tobacco, peanut, and potato field counts.
7. Research project work.
8. Fall combine operations records.

A very definite increase in almost all features of statistical services and requirements has resulted in this biennium.

Division of Test Farms

F. E. Miller



F. E. Miller

This report for the biennium ending June 30, 1942, is to present the program of work underway at the six outlying Experiment Stations, or Test Farms, with brief statements of the results secured from the many projects. More detailed reports on the strictly research work will be found in the reports of the N. C. Agricultural Experiment Station and in bulletins and circulars published by the Experiment Station and the Department of Agriculture.

Cooperation

The program of work during the biennium includes 126 experimental projects, which are handled in coöperation with the N. C. Agricultural Experiment Station of the N. C. State College of Agriculture of the University of North Carolina. The U. S. Department of Agriculture coöperates and aids in supporting many of the experiments. All coöperative investigations receiving Federal support are covered by formal memorandums of agreement which are signed by the executive officers of the agencies contributing toward the work. The research projects on the Station Farms, in the laboratories, and elsewhere, are under the control of Dr. L. D. Baver, Director of the North Carolina Agricultural Experiment Station. The Director of Test Farms also serves as Assistant Director of the Experiment Station.

National Defense

The experiments in many instances have been revised in order to contribute more directly to National Defense measures in agriculture. New tests were started in the spring of 1942 by request of the U. S. Department of Agriculture, which relate to the war program. These include the growing of long staple cotton, the production of peanuts and soybeans for oil, variety tests of castor beans for oil, planting of cork trees, and this fall, dandelion varieties and other rubber bearing plants will be tested.

The personnel of the Division have taken an active part in Civilian Defense. The offices at the Blackland and Upper Coastal Plain Stations have been selected by the War Department as Air Craft Warning Posts and a twenty-four hour watch is maintained at each post.

RELOCATION OF STATION FARMS

In February of 1942, the War Department selected the Mountain Station as a site for the construction of a general hospital. This will be the second largest Army hospital in America, the Walter Reid Hospital, near Washington, being the largest. The construction work on the hospital is now nearing completion and is contracted to be ready to accept patients not later than November 15, 1942. For this project the State has given options to the War Department for the purchase of 216.9 acres of land of the Mountain Test Farm at their appraisal price of $62,128. The remaining 87.13 acres of the Station Farm have been sold to the Swannanoa Valley Farms, Incorporated, for $37,500, which gives a total sale price for the Test Farm of $99,628. This fund will be used for the purchase of land and the setting up of a new Mountain Test Farm. Several sites for the new station are now under consideration.

Plans are also underway for the relocation of the Blackland Test Farm. This has been under consideration for some time. The extensive fires which started in October, 1941, and continued through the winter and spring months further emphasized this need. The fires not only destroyed fences and vegetation, but the soil on several hundred acres of the leased land. The organic soil has burned to a depth of eighteen inches in many places. Then there is a need for soil types other than peat and muck for the various experiments. The coöperative work in "Forest Grazing Studies with Beef Cattle" with the U. S. Forest Service also calls for reed grazing areas in forest lands which cannot be provided on the present location. In addition to these factors, it is desirable to relocate the station on a hard-surfaced road where it will be accessible at all times and where telephone, electricity, and transportation facilities will be available. A survey is now being made to find a site for the new station that will better meet the requirements for the program of work.

GENERAL

During the biennium much improvement work has been completed in the way of repairing and painting buildings, clearing and draining of land, and fencing grazing areas. New farm machinery and implements have been purchased, and 80 acres of land were purchased near the Tobacco Station to provide for needed plot land for tobacco research.

The stations have continued to hold the Annual Farmers' Field Days, which are attended each year by approximately twenty thousand people. Other special meetings are held during the year, such as Small Grain Day at the Piedmont Station, Livestock Day at the Blackland Station, Peanut Day at the Upper Coastal Plain Station, Poultry Day at the Mountain Station, and Tobacco Conference at the Tobacco Station. In addition to these meetings, County Agents, teachers of Vocational

Agriculture, and other agencies, bring groups of farmers to study the various experiments. Visitations to the stations are increasing each year, which emphasizes the growing popularity of the program of work on the different station farms.

RESEARCH

Following is a progress report, by stations. The report on each experiment gives the name of the specialist leader and it is understood that the assistant director in charge of the station contributes to each project in addition to his regular duties as administrative officer of his respective station.

MOUNTAIN STATION—SWANNANOA, N. C.

DEAN W. COLVARD, *Assistant Director in Charge*

Station Established in 1908

Area of Station, 303 Acres. Soil Types: Balfour, Hayesville, Halewood, Congaree, Fletcher.

Elevation, 2,250 feet above sea level.

CLIMATOLOGICAL DATA FOR 1941

Mean Annual Temperature, 57.8 degrees Fahrenheit.
Annual Rainfall, 32.30 inches. Total Snowfall, T.

PUBLIC SERVICE

For the biennium many farm people have visited, called, or written to the station for its various services. The Field Day was cancelled in 1940 due to a flood three days prior to the day on which it was to be held. Approximately 2,500 people attended the occasion in 1940. Also, other farm organizations, such as Farmers Federation, North Carolina Guernsey Cattle Club, Grange, and Vocational Teachers have used the station for public meetings.

Purebred breeding stock, registered seed and other services of this nature have been available to farmers from the station.

IMPROVEMENTS AND ADDITIONS

The burley tobacco barn under construction at the beginning of the biennium was completed and has been in use. Following a fire on February 17, 1941, which destroyed the old implement shed, a new one was constructed. Ten acres of land adjoining the station on the west were purchased. Several buildings were painted and re-roofed in the summer and fall of 1941. A new incubator and set of egg scales were installed by the North Carolina Agricultural Experiment Station. One hundred apple trees were set for replacements.

4-H CLUB CAMP

The 4-H Club Camp located on the station continues to be operated under the leadership of the Extension Service. Each week during the summer from 50 to 125 farm boys and girls attend camp. Most of these groups make a study tour of the station. Each county group spends one week and a total of 800 to 1,000 attend annually.

POULTRY

Coöperating with the N. C. Agricultural Experiment Station

Crossbreeding Broiler Project (R. S. Dearstyne, C. H. Bostian, and J. E. Love): This experiment was started in 1939 and continues. The purpose is as follows:

1. Measure the effect of crossbreeding for broiler production on (a) hatchability of fertile eggs, (b) livability of chicks, (c) growth rate of chicks, and (d) feed consumption of chicks.

2. To determine the finishing quality and market demand for such crosses as are developed.

3. To compare the performance of the female F_1 generation with the performance of their dams.

One White Leghorn male and Barred Plymouth Rock female cross and one Barred Plymouth Rock male and New Hampshire female cross produced 313 eggs each in the year ending in the fall of 1941. A White Leghorn male and New Hampshire female cross produced 307 eggs in the same year and five other crosses produced above 295 eggs each. The process of artificial insemination was used experimentally for all birds hatched in the spring of 1942. The experiment is to be continued for additional information.

AGRONOMY

Coöperating with the N. C. Agricultural Experiment Station

TVA Calcium Metaphosphate Trials (W. W. Woodhouse, Jr.): A comparison of Calcium Metaphosphate as a source of phosphate with triple superphosphate and 16% superphosphate in two different rotations is being conducted. Field 1 consists of Hayesville sandy loam and is planted in the rotation of wheat and soybeans. Field 2 consists of Toxaway loam and is planted continuously in corn followed by crimson clover in the fall.

Small Grain Variety and Breeding Tests (G. K. Middleton) (In coöperation with the U. S. Department of Agriculture):

A. Wheat—A uniform soft red winter wheat nursery consisting of 30 of the most promising varieties each year is planted and records are made of yields and of winter hard-

iness. The mountain area is desirable for testing winter hardiness due to its colder winters than in certain other parts of the State.

Bearded Fulcaster 151 is the highest yielding variety for the mountain area and a registered and certified seed source is maintained by the station.

B. Oats—Spring oat variety tests have included 12 standard varieties and several new smut and rust resistant strains. One new spring variety, Marion, which has consistently yielded equal to the standard varieties, such as White Spring and Columbia, was planted for seed distribution in the spring of 1942.

A winter hardiness nursery consisting of 30 varieties is planted in coöperation with the U. S. D. A. No variety has been found which can be recommended to withstand the severe winter, although in some seasons excellent crops of fall sown oats have been produced. Breeding and selection for increased winter hardiness are underway, and it is expected that varieties with more resistance will be available as the experiments progress.

C. Barley—A winter hardiness and variety nursery and also certain hybrids for selection studies have been planted. Fifty bulk hybrids and five composite hybrids have also been studied. There is a rapidly growing interest in the use of barley for livestock feed in the mountainous area, and the station is prepared with information as to the highest yielding varieties. The Iredell hooded type is being recommended.

Official Variety Tests (In coöperation with the North Carolina Crop Improvement Association) : These tests include varieties of corn, wheat, oats, and barley for which application for registration of certification is made. Data is secured to determine whether a variety may be registered or certified and sold as seed in the mountain area.

Fertilizer Nutrient Ratio Tests in Rotation on Toxaway Loam (Field A—W. H. Rankin) : This test was concluded in 1940.

A Study of Different Fertilizer Treatments Combined with the Effect of Turning All Legumes in a Rotation of Corn, Soybeans, Wheat, and Lespedeza to the Soil as Compared to Taking Off All Legumes (Field R—W. H. Rankin) : Returning legumes will more than maintain yields when all legumes are returned to the soil. Corn and wheat yields have been more than maintained. This test was concluded in 1940.

Hybrid Corn Tests (P. H. Harvey) : As a continuation of the breeding program for hybrid corn, many of the hybrids and selections have been tested for production under Western North Carolina conditions. A few of the highest yielding hybrids at the Mountain Station in recent years have been turned over

to selected farmers for production. The breeding program has gone forward to the point that some hybrids will probably be available to farm people very soon. Farmers, generally, understand better than formerly that hybrids recommended for other areas will not necessarily produce satisfactory yields in the mountain section.

Burley Tobacco (E. G. Moss) : 13 varieties and 10 different fertilizer mixtures have been tested on two soil types. Metcalf Judy's Pride has been one of the highest yielding varieties of a good quality tobacco.

Boron Tests on Alfalfa: It has been found that the application of from 15 to 25 pounds of commercial borax per acre will prevent alfalfa yellows and greatly increase the yield and lengthen the life of the plant.

HORTICULTURE

Coöperating with the N. C. Agricultural Experiment Station,
M. E. GARDNER

Fruit Variety Studies: Forty varieties of apples have been grown in the Mountain Station orchards. No new varieties have been added, but 100 trees have been planted to fill vacancies during the biennium. The Delicious, Stayman, Rome Beauty, and Winesap are among the leading varieties of Western Carolina.

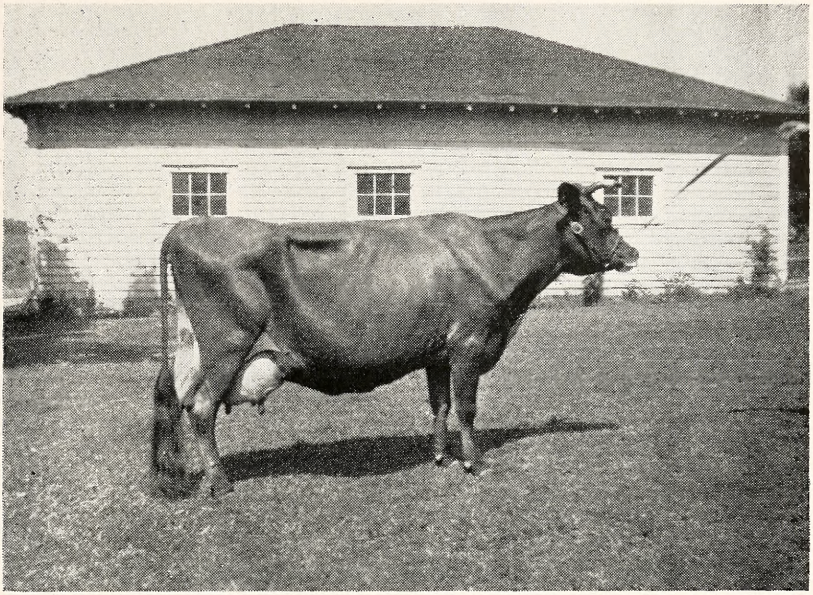
Studies have also been conducted in the use of certain harmone sprays to prevent the premature dropping of the different varieties of apples. These results have been used by some orchardists and have given excellent results.

DAIRY

Coöperating with the N. C. Agricultural Experiment Station,
C. D. GRINNELLS *and* C. M. CORRELL

Dairy Pasture Studies III was concluded in 1941.

Legume Silage Studies: Such preservatives as blackstrap molasses, phosphoric acid, corn meal, cull apples, and apple juice have been used on alfalfa, corn stover, wheat, barley, red clover, soybeans, and combinations of these crops. The use of molasses has proven most practical for preserving silage. Since the beginning of the war, however, a scarcity of molasses has necessitated the use of a substitute. The station is prepared with information relative to the use of corn meal as a ready substitute.



"Ton of Gold" Cow, Rower Seaside Foxy Eva, produced more than a ton of butterfat in four consecutive years.

FORESTRY

R. W. GRAEBER

The four varieties of pines planted in 1934 have remained and are growing well. The trees were planted under the supervision of the Forestry Extension Service and permanent records of timber growth are being made.

Station Taken Over for Construction of Government Hospital

Following the formal entry of the United States into World War No. 2, as a result of a severe attack by Japan on Pearl Harbor on December 7, 1941, it was learned on February 27, 1942, that the War Department was contemplating the construction of a 1500-bed hospital and had selected a part of this station as the site for construction.

Consideration was given to locations in the area of Roanoke, Virginia, and Bluefield, West Virginia, but this section was selected. 109.78 acres of land north of Highway No. 70 were purchased.

Subsequently the announcement was made that a hospital worker's training school would be added, and another request for the remaining 102 acres of land north of the original acquisition and including the area where the 4-H Club Camp is located was made. In addition to these areas, 4.3 acres were requested for the construction of a spur railroad track leading to the

hospital from the south side of Highway No. 70. This required a total acreage of approximately 216 acres, leaving a total of 87 acres. It was learned when a complete survey was made that the total area of the station was 303 acres instead of 330 acres as the original figures had shown.

The taking of these tracts of land completely destroyed the horticultural work, including 500 apple trees, 72 varieties of grapes and several varieties of strawberries and raspberries. It also destroyed the entire poultry department. Buildings taken are shown in the photographs. The burley tobacco barn recently constructed was also destroyed and five tenant houses were taken over by the War Department for use in connection with the project. All of these negotiations were properly made by the officials of the War Department and proper state officials. Payment will be made in accordance with appraisals by the War Department appraisers. It is proposed at the date of this report to sell the remaining land on the south side of Highway No. 70 to the highest bidder by private sale and to relocate the Mountain Station.

Certain projects have been carried on without interruption. The poultry experimental work was moved to rented buildings at Candler, N. C., approximately 25 miles from the original location and the work is being carried on without any break whatsoever in the data. The small grain nurseries were not disturbed until all of the crops were harvested. Hybrid corn tests and official variety tests for the Crop Improvement Association are being carried on south of the area taken over. Certain of the dairy work continues also in the original location.

Studies are underway for the proper location of a new farm and are not sufficiently advanced to include in this report.

PIEDMONT STATION—STATESVILLE, N. C.

J. W. HENDRICKS, *Assistant Director in Charge and Agent, U. S. D. A.*

Station Established in 1903.

Area of Station, 233 Acres (State). 133 Acres (Federal) Soil Type: Cecil Clay Loam.

Elevation, 950 feet above sea level.

CLIMATOLOGICAL DATA FOR 1941

Mean Annual Temperature, 59.5 degrees Fahrenheit.
Annual Rainfall, 34.38 inches. Total Snowfall, 14.25 inches.

General

During the past two years this station has continued its acreage in growing for increased purposes recommended strains of our leading small grains. The work has been primarily with barley, wheat, and oats. Our annual production covering this biennium has been more than 4,000 bushels, and our annual sales

for seed purposes have amounted to around 3,000 bushels. This station has not been able to meet the demands for wheat, barley, and oats.

The small grain during the 1941 season was distributed not only throughout North Carolina, but in many states from Canada to Alabama as well. Reports from all sections indicate that both yield and quality are gratifying. The station only grows for increased seed production such varieties as recommended by Dr. G. K. Middleton, seed breeder for the North Carolina Agricultural Experiment Station.

Piedmont Station's largest small grain seed order—200 bushels of barley and 150 bushels of oats.

During 1940-41 our Annual Farmers' Field Days have been outstanding with attendance of approximately 3,000 people. We have also held during this period Small Grain Field Days and other demonstrations with an average attendance of 300 at these meetings.

The station continues to be a central source of information on agriculture for this section, and the increasing number of visitors each year will give some idea as to how the station's activities are appreciated. Our monthly visits during the summer will average more than 500, these coming as individuals and in groups.

LIVESTOCK

Coöperating with the N. C. Agricultural Experiment Station,
EARL H. HOSTETLER *and* JOHN E. FOSTER

A Study of Pastures and Their Utilization by Sheep (R. E. Stitt, Forage Crops, U. S. D. A.): Grazing work has been in progress with sheep on annual pastures of Abruzzi rye and Korean lespedeza, barley and Korean lespedeza in comparison with permanent pastures. September seedings produced the only fall grazing, and yields of barley and rye were similar. Lespedeza yields were better following barley than rye. The highest yield for the season was produced by the November seeding of rye with lespedeza. The November seeding of barley with lespedeza ranked second in total seasonal yield. The permanent pasture produced less than any of the annuals.

Breeding Stock: The station furnishes ewes and purebred Hampshire rams as breeding stock when available, at reasonable prices.

The Family Sow: This project is to determine the cost of maintaining three purebred sows and one purebred boar and their offspring under general farm conditions. Breeding stock is sold to farmers of the section.

AGRONOMY

Coöperating with the N. C. Agricultural Experiment Station

Fertilizer and Lime Requirements for Cotton, Corn, Wheat, and Red Clover When Grown in Rotation on This Type of Soil (W. H. Rankin): The main objectives of this experiment are as follows:

1. To determine the nitrogen, phosphoric acid, and potash deficiencies of this soil type.
2. The proper proportions of nitrogen, phosphoric acid, and potash that should be used for leading field crops.
3. To determine best quality of fertilizer to use per acre.
4. To study the symptoms of any nutrient deficiencies that may develop.

It has been found that when applied singly, phosphoric acid is the most important nutrient to be supplied for production of corn, cotton, wheat, and red clover, with nitrogen ranking second in importance, and potash the least important as far as yield is concerned. However, for the control of potash deficiency ("rust") of cotton and frenching corn, potash is of primary importance to be added.

From observation on the cotton crop and corn crop on Field A, it is evident that potash deficiency of cotton is most severe in its damage where higher percentages of superphosphate are

applied in the fertilizer mixture, or where it is used in large amounts. Results secured show that an application of one ton of limestone once in the rotation accentuates the potash deficiency of cotton symptoms, lowers the quality of the fiber and the seed of the cotton.

Studies of the Efficiency of Superphosphate and Rock Phosphate as Source of Phosphoric Acid on Cecil Clay Loam Soil (W. H. Rankin) : When equal amounts of phosphoric acid are applied from superphosphate and rock phosphate, the superphosphate produces larger yields than rock phosphate. With the increased quantities of rock phosphate applied, the severity of potash deficiency symptoms and damage has been found to increase. This observation is evident on both limed and unlimed series of plats, it being as in other cases, always more pronounced on the limed series.

A Study of the Yield and Quality of Crops when Wheat and Corn are Each Grown Continuously on the Land (W. H. Rankin) : The most outstanding difference is between corn without lime and a three-year rotation of corn, wheat, and red clover with lime applied once in a rotation. The average yield of corn per acre where corn has been grown continuously with a complete fertilizer is 19.3 bushels, while the average yield of corn per acre in a three-year rotation of corn, wheat, and red clover is 37.3 bushels.

Increase field Iredell Barley strain 23.

Small Grain Fertilization and Cultural Practices (W. H. Rankin) : The seven phases now being studied are as follows:

1. Date and rate of seeding wheat.
2. Date and rate of seeding oats.
3. Date and rate of seeding barley.
4. Time of applying nitrogen for small grain.
5. Amounts of nitrogen for small grain.
6. Amounts of nitrogen, phosphoric acid, and potash for small grain at seeding.
7. Amounts of fertilizer for small grain.

Cotton Improvements (P. H. Kime) : The Mexican Big Boll variety has been the principal variety grown at this station. Pure line selection work is carried on yearly and high yielding strains of uniform staple have been developed, which are well adapted to the conditions under which they are grown.

Cotton Varieties (P. H. Kime) : This project is to make a study of cotton varieties and strains with reference to new types that may be introduced from time to time.

Corn Breeding (G. K. Middleton) : To produce and maintain a high standard of Weekley's Improved, which has been leading in our variety work for many years. The station has been distributing approximately 100 bushels of registered seed corn per year.

Corn Hybrid Investigations (P. H. Harvey) : Corn hybrid yield tests have been conducted for the past two years, using approximately 25 commercial and experimental hybrids secured in most cases from the Corn Belt states. The results have been published in Circular 114. Local varieties are superior to western hybrids in most cases. At present this station has no hybrid to recommend for this section, however, our work indicates that in a few years we will have a hybrid corn of outstanding quality to recommend.

Small Grain Breeding (G. K. Middleton) : The production of varieties of small grain crops including wheat, oats, rye, and barley which are superior in yield, adaptability and disease resistance is the object of this small grain work.

Registered and Certified Seed: The station produces annually approximately 2,000 bushels of registered and certified seeds. The demand for quality seed is increasing from year to year.

Oat Varieties (G. K. Middleton) : The Lee variety has proved to be the best winter oat for fall seeding in the Piedmont area of the State. It is more resistant to winter injury than any known variety. Over a period of fifteen years, it has been our highest yielder.

Barley Selections and Varieties (G. K. Middleton): To develop more reliable types of barley with reference to yield, disease resistance, and other favorable characteristics adapted to Piedmont North Carolina. We find the bearded varieties give us our best yields, while the objectionable feature is the harvesting and threshing. The two outstanding varieties grown in this State are North Carolina Bearded, which is badly mixed, and Tennessee No. 6, a smooth barley which is comparatively pure. These varieties are both susceptible to smut diseases. The station has developed two distinct types of bearded barley and has made one selection from Tennessee 6. These three selections are showing quite an increase in yield over other barleys being grown in this section and are practically resistant to smut. We are increasing this selection as fast as possible.

Head Selection (Barley) (G. K. Middleton): To develop more desirable types of barley, and to compare under uniform conditions those best adapted to Piedmont North Carolina as to yield and other desirable characteristics.

Rye Varieties: To determine the outstanding varieties adapted to this and other sections of North Carolina. Abruzzi gives us our best yield with but very little difference in Abruzzi and Balbo with reference to pastures, perhaps a slight advantage in favor of the latter, but in strength of straw, the Balbo is very deficient and is susceptible to lodging. The station produces approximately 100 bushels of registered Abruzzi for sale each year.

Rust Resistance Studies with Small Grains (G. K. Middleton): To obtain strains of varieties of small grains which are suitable to North Carolina. Also to determine varieties which are more resistant to leaf and stem rust than the varieties which are now commonly grown.

Pasture Fertilizer Tests: To determine the best fertilizer for pastures in Piedmont North Carolina and the time of applying same. Our study reveals that nitrogen is our limiting factor; however, in making a good pasture one should not overlook the value of lime and phosphate.

Soybean Varieties (J. A. Rigney): A soybean variety test was conducted on this station during 1941, but experimental data are not yet available. As utility beans, considering hay and oil, we find Herman and Haberlandt to be outstanding. For hay we recommend Laredo and Otootan.

Cottonseed Treatment (S. G. Lehman): Intensive studies on cottonseed treatment have been conducted for the past two years. We find that where seed are treated we secure a better stand, earlier maturity, with larger yields. We also note less disease with individual plants.

FORAGE CROPS

Coöperating with the Office of Forage Crops, U. S. D. A., and the N. C. Agricultural Experiment Station, R. E. STITT, *U. S. D. A.*

Leafhopper Control on Alfalfa: In order to obtain the best quality of alfalfa the first crop of hay should be harvested before the leaves start to drop. This date usually occurs before May 15. Delaying the harvest of the first crop until about June 1 has reduced the number of leafhoppers enough to prevent injury to the alfalfa. Such a delay in harvest has injured the quality of the hay by loss of leaves to such an extent that the benefit from leafhopper control is offset.

Baling Alfalfa hay.

Harvest Stage of Sericea Lespedeza: Sericea has been found to make the best hay when cut at a height of 12 to 14 inches. They hay is more leafy and contains less tannin when cut at this stage than when allowed to reach a greater height. The palatability of the hay is poor due to the coarse woody stems and the high tannin content when cut at a height greater than 14 inches. When cut at this height two crops can be obtained each year. At this station stands have been maintained over an eight-year period with an average annual yield of 2.2 tons hay per acre.

Lime and Phosphate Increase Yields of Lespedeza and Oats: A fertilizer test with oats and lespedeza in a one-year rotation indicate that lime and phosphate increase the yields of Korean and Kobe lespedeza and Lee No. 5 oats.

COTTON BREEDING STATION

Coöperating with U. S. Department of Agriculture and N. C. Agricultural Experiment Station

Under a Public Works allotment of $56,000 to provide land, buildings, and other facilities for investigational work on cotton, a Federal Station was established in 1936, adjoining the Piedmont Experiment Station at Statesville, N. C. Work at this station is coöperative with the State Department of Agriculture, the N. C. Agricultural Experiment Station, and other State agricultural agencies, with the object of improving the status of cotton production through (1) developing better cultural practices, (2) producing varieties superior in yield and quality and more resistant to diseases and other factors adversely influencing production, (3) studying the diseases of cotton and determining methods for their control, (4) determining the underlying principles concerned in the production of quality cotton and its improvement, and (5) developing and applying methods for utilizing and maintaining quality seed stocks, particularly through single-variety communities. These investigations are a part of a national program of improvements in production and quality American cotton.

Fundamental to such a program is a more thorough study of existing varieties from broad cotton belt standpoint. It is necessary to make a more complete inventory of the present cottons before the most intelligent sort of production is set up for further improvement. Varieties are now being studied with the view of determining the influence of soil, region, season, and variety on yields, useful factors and quality of fibre as measured by field performance, ease of picking, ginning tests, technical measurements of fibre properties, spinning tests, etc.

FORESTRY

Forestry Variety Work (R. W. Graeber) : To determine the best variety of pines in this section. In this experiment we are studying the value of forestry in connection with soil building and erosion prevention. This experiment is only eleven years old, but we are nevertheless observing outstanding results and we are thinning for proper stand.

HORTICULTURE

Coöperating with the N. C. Agricultural Experiment Station,
M. E. GARDNER

Peach Fertilization: This is the seventh bearing year for this orchard. From data received, the following observations are made:

Shortleaf Pine Planting—Piedmont Experiment Station. Planted February, 1927. Thinned November, 1939. Harvested 7 cords of wood per acre. Trees standing 709 per acre.

1. There was practically no difference in total yield between treatment of unfertilized vetch cover crop plus nitrogen applied to the trees and unfertilized vetch alone. These were the two highest yielding plats.

2. N. P. K. applied to the trees under clean culture conditions ranked third in total yield.

3. Vetch cover top dressed with 200 pounds of a 4-12-2 fertilizer plus P. K. applied to trees gave the highest percentage of desirable fruit grades.

Measurements were made on 100 terminal branches from each plat, and the number of fruit heads determined.

Raspberry Fertilization: These plants have been bearing for five years. Harvesting began June 9 and continued through the month. In addition to yield data, leaf counts were made and number, length, and circumference of canes recorded. In connection with leaf counts, comparison was made between sprayed and unsprayed plants.

It is found that by adding one or two more Bordeaux sprays to the schedule, fungus diseases may be largely controlled.

Two red seedlings, U. S. D. A. No. 9 and N. C. R. 30, planted at the station in March, 1935, showed greater resistance to foliage diseases than Latham.

Fruit Variety Studies: This test has been continued with peaches, cherries, grapes, apples, and small fruits to determine varieties best suited to Piedmont conditions.

TOBACCO STATION—OXFORD, N. C.

E. G. MOSS, *Assistant Director in Charge and Senior Agronomist, U. S. D. A.*

Station Established in 1912.

Area of Station, 329 Acres. Soil Types: Durham and Sandy Loam.

Elevation, 500 feet above sea level.

CLIMATOLOGICAL DATA FOR 1941.

Mean Annual Temperature, 58.9 degrees Fahrenheit.
Annual Rainfall, 29.97 inches. Total Snowfall, 2 inches.

General

The primary object of the work at the Tobacco Station is to improve the tobacco crop by better cultural methods, better methods of applying fertilizers, crop rotations, varieties, disease control and better curing methods.

In addition to the work which is being carried on at the Tobacco Station, intensive studies of tobacco diseases are made with particular reference to Granville wilt, root-knot, black shank, and black root rot. In order to carry on these four projects, three men are employed for this work, namely: James F. Bullock, T. E. Smith, and K. J. Shaw. For this work there has been leased a plot of land consisting of 4 acres in Forsyth County for the study of black shank, ¾ acre in Guilford County for the study of black root rot, a plat of land in the southern part of Granville County near Creedmoor consisting of 8 acres for the study of Granville wilt, and 20 acres in Wake County, which is a part of the McCullers Branch Experiment Station.

RESEARCH

All research with tobacco is handled in coöperation with the U. S. Department of Agriculture and the N. C. Agricultural Experiment Station.

The general leaders in all tobacco experimental work in the State are W. W. Garner, E. G. Moss, James F. Bullock, T. E. Smith, K. J. Shaw, and J. F. Lutz.

The Results Secured from Fertilizer Studies: During 1941, the results secured from fertilizer studies have further emphasized the importance of stepping up the rate of potash applications in mixed fertilizers at the same time, however, indicating where high rates of soluble salts were used directly under the tobacco plants poor stands were secured, resulting in reduced quality and yield. To avoid such trouble fertilizers should be applied three to four inches to each side of the plants, or if placed directly under the plants, should be thoroughly mixed with the soil before transplanting is done.

Large quantities of nitrogen injure the quality of flue-cured tobacco more than excesses of any other element. For this reason the amount of nitrogen used should be kept at the minimum required to produce a satisfactory yield. In order to do this a careful study should always be made of the previous cropping system used.

Cropping Systems: Rotation of crops, or cropping systems, play an important part in the control of root diseases of tobacco as well as in keeping the land in the proper tilth. This is especially true of such diseases as Granville wilt, root-knot and black shank. Red Top, or Herds grass, appears to be the only grass that is highly resistant or immune to Granville wilt and root knot. Common weeds may be used to precede tobacco on root-knot infested land with good results. On the other hand, land infested with Granville wilt should never be allowed to grow a crop of weeds.

Varieties: Progress has been made in standardizing the flue-cured varieties over the entire belt. The Tobacco Station has found no reason for changing the recommendation previously made concerning the seven standard varieties, but

1941 Variety Field at Tobacco Station, Oxford, N. C.
Left: 2 rows 401. Right: 2 rows Mammoth Yellow.

have added two more varieties. No. 400, which has been developed as one which is highly resistant to Black Root Rot (Thielaviopsis), is one of the new varieties just released. The other is a cross between Cash and No. 400 released under the name 401. Both of these varieties have some resistance to leaf spot diseases. Number 400 is recommended for areas infested with black root rot, which is more prevalent in the Old Belt (Piedmont area), and is not recommended for the

Eastern and South Carolina Belts. The 401 may be planted anywhere in the flue-cured area. It is believed the 401 will add $40.00 to $50.00 per acre over a number of the other varieties. Studies of other varieties that are resistant to diseases and will produce tobacco of improved quality are being continued. A very satisfactory variety which is resistant to Black Shank (Phytophthora) has been developed after numerous back crosses and selections. It is expected that this variety may be released for the 1943 crop. A resistant variety for Granville wilt and Mosaic appears to be in sight. The three

Plant in foreground No. 401, a new variety which is No. 400 crossed on Cash. The four-year average value of this variety was $40.00 per acre more than the standard varieties.

latter diseases cost the tobacco farmer in the flue-cured area alone well over a million dollars annually. It should be noted, however, that in order to get resistance to a disease and high quality at the same time requires an almost unlimited amount of experimentation. A high quality tobacco must have not only color, texture and yield, but it must have "aging" qualities, aroma and free burnish qualities, as well. To determine these qualifications requires time. Chemical analysis is helpful, but the final test, which is the smoking of the leaf, requires from 24 to 30 months for "aging" before the leaf can be made into cigarettes.

Studies of the Curing Processes: These studies were continued, but not much progress was made due to the lack of sufficient trained help at the critical time. It is, however, planned to continue these investigations during the coming

season as it is possible that some engineering help may be available for the period of about six or seven weeks. This field of investigation needs considerable study as there is a good opportunity for improvement.

Further Studies in Tobacco Seed Bed Management: These studies indicate that as a rule too much fertilizer is being used. One and one-half pounds of a 4-9-3 or one pound of a 6-9-3 plant bed fertilizer to the square yard will produce as many, and in some cases more, plants than heavier applications. Insects and diseases have caused considerable damage to seed beds and in many cases have caused the farmers to double their plant bed area to offset such damage. Both can now be controlled and narrow, well-prepared beds would produce more and better plants if insect and disease control recommendations were followed.

The Entomology Group of the U. S. D. A.: This group, located at the Tobacco Station, has continued studies on insect injuries to seedlings and to the tobacco in the field. Efforts are being made to discover cheaper and more efficient insecticides used on this crop. Studies are being continued on the control of the tobacco moth in farmers packhouses. In a number of isolated cases the moth has done considerable damage to the cured tobacco in bulk.

Spacing: The spacing of plants 22 inches in 4-foot rows seems to give the maximum results in yield without injury to the quality.

Studies of the Relative Yields of Lug and Leaf Grades: These studies have been continued. Indications are that the variety as well as the season are important factors in determining the amount of lugs or cigarette tobacco grown. In 1941, the 401 tobacco had a total of 66 per cent lugs, 32 per cent leaf, and 2 per cent trash. The Bonanza produced 52 per cent lugs, 45 per cent leaf, and 3 per cent trash. The percentage of lugs was higher in both than in 1937, 1938, and 1939, also higher than in 1940. The tobacco having greater percentages of lugs than the leaf grades are more desirable as the lugs are more desirable for cigarettes.

Aromatic Tobacco: Due to the unsettled conditions in foreign countries where most of the aromatic tobaccos have been grown, it was considered desirable to begin some preliminary studies with this type of tobacco in this country. In 1940 about 1¼ acres of a number of these varieties were planted at the station at Oxford and a similar amount at Chatham, Virginia. In 1941 the acreage was doubled at both places. Two new tobacco barns were built in 1941 at the Oxford station. The results secured so far indicate that tobacco of fair to good quality can be grown. Four of the better varie-

ties have been selected and enough seed saved and are available when needed to plant 50 or more acres. This work has been carried on with the coöperation of Duke University, and it will be continued in 1942.

Root Knot (*Heterodora marioni*) (K. J. Shaw) : Root knot was exceptionally severe in 1941 and the results with the various experiments were of unusual interest.

Tests with Rye Cover Crops: Tobacco grown on badly infested soil after a winter cover crop of rye gave an average difference, for three different dates of planting, of 513 pounds or $187.29, at 1941 prices, more than tobacco grown without any cover crop. Smaller differences in favor of a rye cover crop were obtained during other seasons under less severe root knot conditions. The cover crop delayed disease development and provided more favorable soil conditions for plant growth. Root examinations made at the end of the season showed that root knot was severe whether rye had been used or not.

Crop Rotation Experiments: Tobacco was grown after one year of peanuts, cotton, corn, weeds, oats and weeds or continuous tobacco. Only the peanut rotation gave statistically significant reductions in amount of root knot over that occurring on tobacco grown after tobacco. The yield and value of the cured leaf was increased by all rotations, except cotton, over that produced by tobacco grown after tobacco.

Methods of Cultivation: Ridge cultivation, flat cultivation, or different methods of applying the fertilizer did not lower the amount of root knot or increase the yield of tobacco.

Varietal Resistance: Certain collections of *N. tabacum* obtained from Central and South America have shown considerable resistance to root knot. A breeding program is in progress to combine root knot resistance with flue-cured quality.

Progress in the Development of Varieties of Tobacco Resistant to Granville Wilt (*Bacterium solonacearum*) (T. E. Smith) : A high degree of resistance has been found in certain collections of foreign tobacco and in hybrids of T.I.79A x Turkish Xanthi, two moderately resistant strains. Tobacco Introduction No. 448A is the most promising for practical use in the breeding program because of its large size. The prospects are bright for the development of strains of flue-cured quality with resistance to Granville wilt.

Fusarium: (T. E. Smith and K. J. Shaw) Fusarium wilt of tobacco is of importance in the state only in Columbus County and is entirely different from Granville wilt. Tobacco developed *Fusarium* wilt when grown in soil previously planted to sweet potato in several fields. Inoculation experiments demonstrated that twenty-two isolates from flue-cured tobacco were all patho-

1941. Untreated plot. Planted to corn in 1940 and to tobacco in 1941. 70% of tobacco died with wilt.

Plot treated with Uramon at the rate of 1,000 pounds per acre in 1940 and planted to corn. In 1941 plot planted to tobacco and 100% of the tobacco matured and was harvested.

genic for sweet potato. Four of twenty-two isolates from sweet potato were pathogenic for flue-cured tobacco. The results show that it is a bad practice to grow tobacco or sweet potato on soil where *Fusarium* wilt of either crop occurs. Similar cross-inoculations with isolates from flue-cured tobacco and cotton were negative.

Progress in Development of Breeding Stocks Resistant to Fusarium Wilt of Tobacco (K. J. Shaw and T. E. Smith) : Two hundred and twenty-three strains of *N. tabacum* of foreign origin, were tested for resistance to *Fusarium* wilt in greenhouse trials. Forty-eight of the more promising strains were tested in the field by inoculations made at transplanting time. Nine showed a high degree of resistance. One, of twenty-two flue-cured varieties tested, was moderately resistant in preliminary field trials.

Progress in the Development of Chemical Methods for Sterilization of Soil in Tobacco Seed Beds (K. J. Shaw and T. E. Smith) : A high yield of tobacco transplants was obtained in preliminary trials on small plots with two different treatments that controlled weeds and root knot. One pound of cyanamid in combination with 36 c.c. of chloropicrin or one pound of urea per square yard were mixed into the soil in the fall, the soil surface wet to a depth of two inches and seeded in the spring to tobacco in the usual way. It is hoped that these or other treatments under test will meet the urgent need for practical methods of controlling weeds and soil-borne diseases in tobacco seed beds.

UPPER COASTAL PLAIN STATION—ROCKY MOUNT, N. C.

R. E. CURRIN, JR., *Assistant Director in Charge*

Station Established in 1902.

Area of Station, 449 Acres. Soil Types: Marlboro, Rustin, Dunbar, Coxville with Norfolk Series Predominating.

Elevation, 100 feet above sea level.

CLIMATOLOGICAL DATA FOR 1941.

Mean Annual Temperature, 61.1 degrees Fahrenheit.
Annual Rainfall, 46.47 inches. Total Snowfall, 3 inches.

General

This station continues to serve as a center for agricultural research for the Upper Coastal Plain section of the State. The principal projects deal with tobacco, cotton, corn, peanuts, soybeans, and small grains. Considerable work has been done in the past two years clearing new ground, ditching, terracing, and building farm roads. The principal buildings have been painted during the biennium.

AGRONOMY

Coöperating with the N. C. Agricultural Experiment Station

Cotton Breeding Studies (P. H. Kime) : Improvement in uniformity of staple, fineness and strength of fiber, earliness, productiveness, and other qualities to meet mill demands of

the State and increase income to growers. Inbreeding, selection and hybridization methods are being used. Several pure lines have been isolated from various commercial varieties. A few of these have produced excellent yields and are quite uniform. Fiber quality as indicated by X-ray photographs ranged from fair to very good. One in particular was especially good. Two early Mexican strains are quite productive and good fiber quality is indicated by the X-ray. A large number of selections from double cross hybrids were grown in 1940 and 1941. Thirty-three hybrids, six inbred lines and fifteen Mexican strains were in yield tests in 1941. Forty-four hybrids and a number of other seed stocks are being tested in 1942. Some of those selections tested in 1941 were quite promising especially those from two hybrids combinations. Variety tests were also carried on during 1940 and 1941 to determine the relative value of new varieties and strains as compared with standard varieties. Approximately ten acres were used for testing varieties, inbred lines, hybrid selections and for growing a large number of plant selections each year.

Long Staple Cotton (P. H. Kime) : A small acreage of Wilds long staple cotton is being grown in 1942 in connection with the program for increased production of long staple cotton needed in war materials.

Castor Beans (P. H. Kime) : Varieties of Castor Beans are being tested in 1942 to determine their adaptation, earliness, yield and resistance to disease in case large scale production should be called for in 1943.

Peanut Fertilizers and Rotation Experiments (E. R. Collins and J. J. Skinner) : Nutrition of peanuts and cotton grown in rotation with soil building and feed crops. Results seem to emphasize the importance of calcium for peanuts.

Peanut Breeding, Spacing and Variety Studies (G. K. Middleton, P. H. Harvey, and E. F. Schultz) : Varietal studies show Virginia Bunch strains better adapted than strains of the Jumbo Runner type in the area of the Upper Coastal Plain Station. Two improved strains of this type are being multiplied for distribution. Over six hundred new selections from farmers' stock peanuts have been tested in the last two years, and a few produced better yields than the varieties from which they came. Hybrid material grown in 1941 consisted of about 120 progenies which had been advanced to the fourth generation and in addition approximately 8,000 plants in the F_3 or from back crosses. The original crosses were principally between strains of Virginia Bunch, Jumbo Runner, Spanish and Valencia types. The most promising material is coming from combinations of the large types. A new set of crosses was made last winter for the express purpose of trying to increase the oil content in large seed varieties. Cultural studies under way

The effect of the method of applying potash lime to peanuts on the stand. Rows number 1 and 3 received 300 pounds of 12 per cent potash lime on top of the row two weeks after planting. Number 2 and 4 received 300 pounds of 12 per cent potash lime mixed with the soil in furrows before planting.

involve date of planting, width of rows, distance between hills, ridge versus flat culture, bacterial inoculation and date of harvest. The most outstanding results have been secured in the date of planting experiment, where for two years an average increase of 193 pounds of marketable peanuts per acre, or 16 per cent, has been obtained by planting April 10th as compared with planting May 10th. Similarly, a decrease of 36 per cent in yield of nuts has been obtained by delaying planting until June 5th.

The Improvement of Corn Varieties Including Tests of Hybrids and Top Crosses (P. H. Harvey) : During each of the three growing seasons covered or partially covered in this biennium slightly more than ten acres of land has been or is being utilized in testing corn hybrids. In the 1940 season approximately 350 hybrid strains were tested for yield and general adaptation in the Upper Coastal Plain. During each of the following seasons more than 400 hybrid strains have been included. A two acre hybrid seed producing block was grown in 1941 in which fifteen white hybrids were produced on a limited farm scale. Most of the general crop of corn on the station in 1942 is of these hybrids.

The effect of fertilizer placement on the stand of cotton. Row number 1 received the fertilizer in two bands on each side of the cotton seed and slightly below the level of the seed. Number 2 and 3 received the fertilizer in conventional manner of placing the fertilizer under the seed and then bedding on the fertilizer before planting.

Cotton Fertilizing Methods (E. R. Collins) : Studies in different methods of applying fertilizers to cotton have led to very definite conclusions that placing the fertilizer 2½″ to the

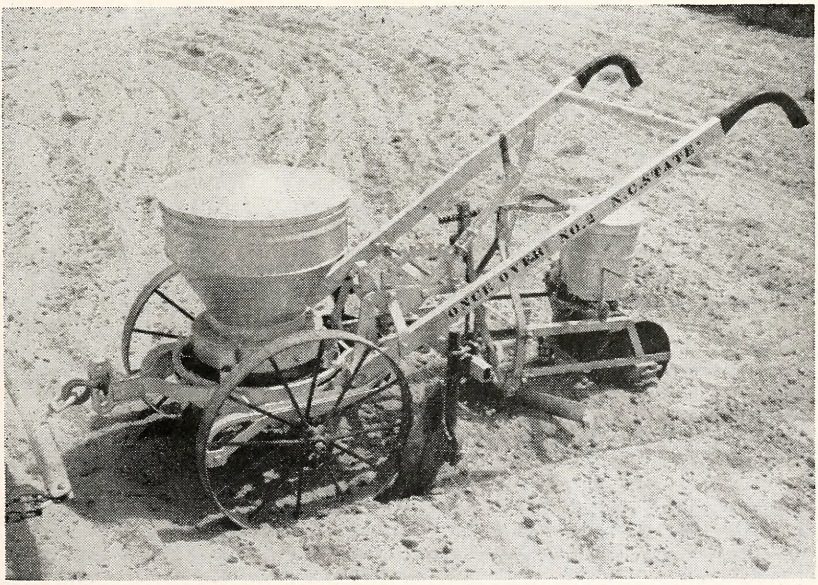
Showing the complete loss of cotton leaves where the potash fertilization at planting time was not supplemented by further potash topdressing.

side and 1″ below the seed gives a better stand of plants and yield of cotton as an average over a nine year period. Several commercial types of planters and fertilizer distributors were tried out to determine their efficiency in the placement of fertilizer. Very few of the one-horse drawn machines have proved satisfactory. Some machines did not distribute fertilizer uniformly, some placed it improperly, and still others were mechanically defective. One of the two-horse drawn machines did the work fine in every respect; however, its cost would make it impractical for use by small farmers.

The "Once-Over Fertilizer Distributor and Seed Planter," designed by Professor G. W. Giles of the Agricultural Engineering Department at State College gives good results and shows much promise.

Cotton, Corn, Soybean, and Small Grain Variety Test: (Began 1942) N. C. Crop Improvement Association. Object to find the most suitable varieties for this section of the State.

Soybean Strain (J. A. Rigney) : Planting tests were begun in the spring of 1942. Variety tests have been continued and studies are made on yields, oil content, and shatter-proof of the different varieties.



"Once-Over" fertilizer distributor and seed planter designed by G. W. Giles of the Agricultural Engingeering Department in coöperation with E. R. Collins of the Agronomy Department of State College.

Corn Fertilizer Test (W. H. Rankin) : This experiment deals mostly with the amounts and time of applying nitrogen to corn.

Fertilizer Test with Cotton (E. R. Collins and J. J. Skinner) : This experiment is to study the damage to cotton seedlings caused by applying varying amounts of salts concentrations. No data are available to date upon which any conclusions may be drawn.

Tobacco Variety Test: The object is to find the varieties or strains that will give best yield, quality and most resistant to disease. Virginia Bright Leaf Strain No. 1 has given good results. Special 400 and Gold Dollar have also done well in the tests.

Tobacco Fertilizer Test: In this test the amounts of calcium, potash and sulphur are varied. We find that potash in the mixed fertilizer can be raised to 16 per cent with advantage. Relative high amounts of sulphur can be used if the potash is used in proportion.

PATHOLOGY

Coöperating with the N. C. Agricultural Experiment Station

Cotton Seed Treatment (S. G. Lehman) : Different materials were used on acid delented, machine delented, and fuzzy seed. Treated acid delented and treated machine delented proved better in most instances than treated fuzzy seeds. Some of the new materials are promising, but do not have enough data to recommend them yet.

Peanut Disease Control Studies (Luther Shaw) : This work was started in the spring of 1938 and consists of chemical treatments and the study of rotation in relation to the control of diseases. This work has not progressed to the point that conclusions can be made.

Dusting Peanuts for Leaf Spot Control (Luther Shaw) : This test consists of different dusting and spraying materials applied at different times and varying amounts. Very promising results have been obtained by applying sulphur dust with 3 to 6 per cent copper, beginning about July 15th and dusting 3 to 4 times at intervals of about two weeks apart. Dust applied at rate of 15 pounds each application. Yields have been increased from 300 to 400 pounds of peanuts, and both the yield and quality of the hay has been improved.

Blue-Mold Control (J. P. Young) : The use of Paradichlorobenzene on plant beds gave almost perfect control of blue-mold.

ENTOMOLOGY

Cotton Insect Studies (Z. P. Metcalf) : Work on the study of cotton insects was begun during the spring of 1940. No data are available on this study at present.

HORTICULTURE:

Regional Sweet Potato Test: This experiment was started in the spring of 1942 in coöperation with several other States in the South.

BLACKLAND TEST FARM—WENONA, N. C.

J. L. REA, JR., *Assistant Director in Charge*

Station Established in 1912.

Area of Station, 362 Acres (State). 1,158 Acres (Leased). Soil Types: Peat and Muck.

Elevation, 16 feet above sea level.

CLIMATOLOGICAL DATA FOR 1941.

Mean Annual Temperature, 58.6 degrees Fahrenheit.
Annual Rainfall, 36.04 inches. Total Snowfall, 2 inches.

General

The Annual Field Day has been held during the past two years with approximately 1,200 people attending each year. In addition to the field day meetings a special Livestock Day has been held each year. These special livestock days have been very beneficial in that only the people interested in livestock have attended.

The station has been called upon to assist during the war emergency. An aircraft warning post has been set up at the station with a 24-hour watch in effect.

The work of the station during the spring and fall of 1941 was very seriously affected by forest fires which burned over the entire beef cattle grazing area. The fences were partly destroyed and had to be rebuilt during the winter. Some of the peat soil was burned so deeply that all reed growth was destroyed. Fortunately, the cultivated area of the station was damaged to a very small extent by the fires. Some eight or ten acres of soil that was being used as pasture was burned to a depth of eight to fifteen inches. The smoke from the ground fire during the fall was so dense that little progress could be made with the farm work. Most of the time was spent in trying to keep the fires under control.

RESEARCH

The beef cattle experimental program has been greatly enlarged through a special appropriation by Congress for this work. The beef cattle herd has been doubled and the grazing land used in connection with the cattle work increased about three times its original size. The station now has control over enough grazing land to take care of any reasonable increase in this work for the next few years.

ANIMAL HUSBANDRY RESEARCH

In Coöperation with the N. C. Experiment Station, EARL H. HOSTETLER *and* JOHN E. FOSTER, *and the U. S. Department of Agriculture,* H. H. BISWELL *and* R. W. COLLINS, *U. S. Forest Service*

BEEF CATTLE

Cottonseed Meal vs. Soybean Meal for Fattening Steers: A summary of the steer feeding trial just completed for the year 1941-42, in which cottonseed meal was compared with soybean oil meal as protein supplement for finishing yearling steers, gave the following results:

Soybean oil meal produced greater gains required less feed per unit gain, and cheaper gains than the cottonseed meal; however, none of these differences were large and would probably not be significant. For example, for the cottonseed meal and soybean oil meal groups respectively the average daily gains per steer were 2.20 and 2.22, and the cost of gains per 100 weight were $13.94 and $13.86. These were based on the feed prices of shelled corn, 80¢ per bushel, 41% cottonseed meal, $43.75 per ton, soybean oil meal, $44.50 per ton, soybean hay, $20.00 per ton, and corn stover, $6.00 per ton.

Utilization of Reeds in Forest Grazing: Test started at Blackland Station in Spring of 1941 with grade Hereford cattle which were grazed on reeds (Arundinaria tecta) until November 6th.

A—*Rotational Grazing:* Continuous grazing was compared with changing to new pasture on August 14th, and with rotating between two pastures every 28 days. Three groups of ten yearling steers each were used in one set of pastures and the comparisons repeated in another set of pastures with yearling heifers. Stocking was at the rate of three acres per yearling for the season.

B—*Creep Feeding Calves* (4 parts corn and 1 part C.S.M.): Four groups of ten cows and ten calves were each used. Group I and and IV received no supplement. Group II calves creep fed throughout period. Group III calves creep fed after August 14th, and Group IV moved to lespedeza pasture on August 14th.

Cows and calves made very satisfactory gains on reeds. Creep feeding increased rate of calf gains, but was more important after August 14th. Shifting to lespedeza pasture after August 14th made the greatest total gains. The gains of the yearlings were poor and the differences between the groups were not significant.

Not only did creep feeding increase the rate of gain of nursing calves, but this spread continued after weaning when all four groups were turned together and wintered on approxi-

Calves on creep feeding experiment.

mately 2.5 pounds of cottonseed meal per head daily and roughage, with access to corn stalk and soybean field gleanings.

Effect of Rate of Grazing on Burned and Unburned Areas: Burning delayed start of grazing season by at least two weeks, reduced the carrying capacity, and made the reeds more easily killed by grazing especially when heavily stocked.

Destroyed by fire fall of 1941.

There are over 9,000,000 acres of forest land in the Coastal Plain region of North Carolina and of this acreage, some 3,000,000 acres are in reeds. Based on the results of the tests at the Blackland Station this would furnish grazing from May

After forest fire on November 21, 1942.

Showing recovery from fire where soil did not burn, on July 23, 1942.

to November for 750,000 beef cattle. Or, if used for both winter and summer grazing, it would furnish 9 to 10 months feed for 375,000 beef cattle. This would be a 20 to 40 million dollar enterprise built up largely around reeds.

The Blackland Station results showed that if reeds were fully utilized in conjunction with general farming that cattle could be fed through the year at approximately $10.00 less

General view of reed experimental pasture area.

per head than when they were carried entirely on the farm. For a farm herd of 30 cows this would mean an annual saving of $300.00 on the cows alone. In other words, the reeds in the Coastal Plain, if properly utilized, could mean a yearly saving in feed costs of over 3 million dollars.

SHEEP

Mineral Studies with Sheep: Breeding ewes which had access to a mineral mixture of ground limestone, steamed bonemeal and salt gave slightly better results than a similar group which received only salt as mineral. Likewise, the addition of iron and copper to a mineral mixture containing calcium, phosphorous and salt gave slightly better results than a mineral mixture of only calcium, phosphorous and salt. As you no doubt know, in this last year's trial the addition of cobalt to the mineral mixture of calcium, phosphorous, salt, iron and copper gave a greatly improved result. We are repeating this trial this year to confirm the results. However, this past year 10 lambs were raised in the cobalt group as compared to only 3 in the non-cobalt group.

Value of Shearing Spring Lambs: Spring lambs that were shorn about the middle of June gained nearly 1/10 pound more per head daily until about October 1st than similar lambs that were unshorn. After this date there was no appreciable difference in the rates of gain. Not only did the shorn lambs gain more during the hot months, but they remained more vigorous and no losses occurred in this group as compared to three deaths in the other group. These results were from three tests conducted at the Blackland Station, but similar tests conducted at the Central and Piedmont Stations corrobate these findings. The total wool obtained from the shorn group as lambs and yearlings was a little over ½ pound more than that obtained from the yearlings in the unshorn group. This paid for the extra cost of the additional shearing.

From the standpoint of greater gains, more vigor and less death losses during the hot months, the practice of shearing early lambs in June may be practical for grade ewe lambs obtained in the flock, and especially so for pure breds.

SWINE

Comparison of Protein Supplement for Fattening Pigs: Sixty pigs were equally divided into two groups. Group 1, fed shelled corn; half 50% tankage and half C. S. meal and mineral free choice. Group 2, fed shelled corn; half 50% tankage and half peanut oil meal and mineral free choice.

Group 1 made a daily gain of 1.84 and Group 2 a daily gain of 1.93 pounds. The cost per 100 gain for Group 1 was $7.99 and for Group 2, $8.34.

WORKSTOCK

The station is continuing to breed the Percheron mares kept on the station to produce all the work stock required with the surplus animals being transferred to the other stations. The only experimenal work being done at this time is to weigh the animals at definite intervals to determine the rate of growth and to keep records on the amount of feed required to carry the colts to work age. This work has not been carried on long enough to reach any definite conclusions.

AGRONOMY

In Coöperation with the N. C. Agricultural Experiment Station

Hybrid Corn (P. H. Harvey) : A number of corn hybrids are being tested. None of the hybrids so far tested seem to meet our requirements, although some of the hybrids have out-yielded our self-pollinized variety. Our Hyland Horsetooth corn is being crossed on the pure strains in an effort to develop a suitable hybrid for this section.

Soybean Varieties (J. A. Rigney) : Variety testing of soybeans is being carried on each year. Several varieties not commonly grown in this section are showing up well in the tests. The varieties are being tested for both hay and seed. Among the high yielders for seed are Wood's Yellow, with 32.5 bushels; Arksoy, 29.6; Ogden, 26.8; Tokio, 25.8. For hay the following varieties lead in the amount of hay produced per acre: Ogden, 5,764 lbs.; Wood's Yellow, 5,304 lbs.; Arksoy, 5,211 lbs.; Tokio, 5,204 lbs.

A Three-year Rotation of Corn, Irish Potatoes, and Oats (E. R. Collins) : This has been continued seventeen years with different levels of fertilization. The average increase for fertilization for the seventeen year period was 16.9 bushels of corn, 78.4 bushels of Irish potatoes, and 1,656 lbs. of oat hay. When this field was uniformly fertilized, the same plots as above gave differences of 2.3 bushels of corn, 19.7 bushels of Irish potatoes, and 113 lbs. of oat hay. This indicates that on this plot, yield differences can be largely overcome in one year by proper fertilization.

Rotation Experiments (E. R. Collins) : Corn is grown with different fertilizers and in rotation with other crops on this field. Phosphate fertilizers show marked stimulation in early growth of the corn. Yield data obtained from these plots do not show an advantage from the phosphate although this early stimulation is very noticeable. No differences have been shown

Corn in Rotation Experiment. 1—No treatment. 2—40 pounds KCL.

on this field whether the nitrogen and potash were applied at planting or applied as a top dresser.

Fertilizer and Lime Requirements for Corn and Soybeans (E. R. Collins) : This field has been continued under the rotation of corn and soybeans in alternate years. Phosphate injury has been very noticeable on the soybeans and therefore has been left off the soybean crop for the last two years. Response to potash is the major response that has been obtained on these two crops.

Improvements and Machinery Added

All of the dwelling houses and some of the out-buildings have been painted and as much general repair work done as time and funds would permit. This work has largely been done with farm labor after field work has been finished.

Several pieces of new farm machinery have been purchased during the past two years. This has greatly added to the efficiency of the farm work. The following farm machinery has been purchased.

1. 6 Ft. International combine.
2. M International tractor.
3. Two-row cultivator for M tractor.
4. Bearcat hammer and ensilage mill.
5. 1½ Ton Ford truck.

COASTAL PLAIN STATION—WILLARD, N. C.

CHAS. T. DEARING, *Assistant Director in Charge and Agent, U. S. D. A.*

Station Established in 1905.

Area of Station, 445 Acres. Soil Type: Norfolk Sandy Loam.
Elevation, 51 feet above sea level.

CLIMATOLOGICAL DATA FOR 1941.

Mean Annual Temperature, 63.1 degrees Fahrenheit.
Annual Rainfall, 41.29 inches. Total Snowfall, T.

Public Relations

The station reaches the public through many channels; through public meetings, research activities, demonstrations, correspondence and the furnishing of information to day by day visitors.

Perhaps the most outstanding public relation is that which exists in connection with the Annual Field Days and Picnics. Each September the stations holds an Annual Field Day on the second Thursday and this is followed by a Negro Farmers Field Day on the second Friday. In recent years the Negro Farmers Day has increased in attendance so that there have been approximately three thousand people here on this day each year during the past biennium. The Annual Field Day on Thursday has continued to draw its large crowds of from five to eight thousand people. In the autumn of 1941, Honorable Graham A. Barden, Member of Congress from the Third North Carolina Congressional District, delivered the principal address, and in the autumn of 1940 we were honored by the presence of our Governor, the Honorable J. Melville Broughton. The theme of the addresses during this biennium has related to preparations for the conditions brought about by the World War and the part that rural people should play in coöperation with the other classes of people in this country.

Workers of the station have also coöperated with the Civilian Defense organizations of the county and the section and have rendered service to this organization in various ways and participated in its activity.

IMPROVEMENTS

While improvement work has not progressed at the same speed it has been carried on during the two previous bienniums, when we had the aid of the WPA and related organizations, the station has, nevertheless, made substantial progress. The last WPA project was completed during the first six months of the biennium period. It was during this period that we completed construction of our new seed house, farm work shop, and farm smokehouse, and we have also provided a blacksmith shop. On the dairy side a resting lot adjoining the grazing areas has been constructed, and concrete terraces have been installed in the main dairy lot adjoining the milking barn for the purpose of retaining soil against erosion. Some additional terracing, ditching

and stumping have been done in this area for the purpose of clearing up the few remaining bad stumps in the grazing area.

The principal improvement during the period has been a program of painting under which practically every building at the station has had attention. The painting up of all buildings and the minor repairs which were carried on in connection with same, greatly improved general appearances. In addition to the painting done by the State, through Government coöperation other buildings on the station were added to the program.

Another improvement was the construction of 15-ton truck scales complete with foundations at the dairy barns for use in weighing incoming supplies and for weighing animals, hay, etc., in connection with the research work of the station.

DEMONSTRATIONS

The station has entered into an agreement with a prominent bee man of the State, who at the time was President of the State Bee Keepers Association, for the development of a demonstrational commercial bee project. This project has been developed to the point of fifty hives and it is serving as a particularly timely demonstration now that sugar is being rationed and it is desirable for farmers to get themselves on a live-at-home basis. The project not only serves as a demonstration, but the presence of the bees has distinct value in aiding the pollination of the crops of the station, especially the fruits and forage crops.

The station has undertaken tests of a minor nature having to do with the growing of cork and the culture of plants which might serve as a source of rubber, and also certain plants of a more or less medicinal nature; plants furnishing drugs which might be scarce or difficult to procure under war conditions.

Another demonstration conducted in the autumn of 1941 was a cheap silo made from sisalkraft paper and ordinary woven wire fence. It was found that a silo of this type could be constructed for approximately $25 and reconstructed in future years for approximately $15, and that this silo would serve satisfactorily for the preservation of roughage as ensilage. While the results were not as favorable as desired, the ensilage was sufficiently good. There was trouble, to some extent, from molding around the outer edges.

The station has also undertaken to have a demonstrational Victory garden and to produce a field of soybeans for oil purposes as a War activity demonstration.

RESEARCH

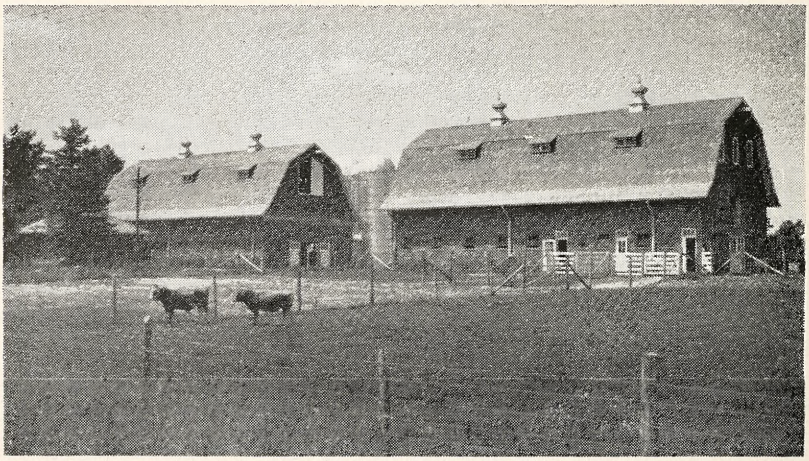
Poultry Investigations

Coöperating with the N. C. Agricultural Experiment Station,
R. S. DEARSTYNE *and* C. O. BOLLINGER.

In the poultry project the work of the station relating to studies of protein feeds has been completed and in addition to

bulletins previously published, bulletin No. 326 of March, 1940, was issued from the State Experiment Station summarizing the research work relating to the substitution of peanut meal in part for the animal protein in laying mash on egg production, livability, and hatchability of chicks. This is an important bulletin which emphasizes the possibilities of using the native peanut protein in lieu of any other animal proteins which are more expensive and which are produced largely in other states.

At the present time there are two principal poultry projects. One relates to the development of superior families of Rhode Island Reds and the other is a study of the effects of various stimulating practices on egg production and livability of pullets. In the first project there are thirty-five families containing a total of 277 birds at the present time. Investigations are being made on family performance rather than individual performance, and many data are being taken on the intensity and persistency of lay, sexual maturity, egg size, livability and hatchability of eggs, all of which are of commercial importance. The surplus from this breeding project has been sold to farmers and poultry breeders with a view to building up the general poultry stock of the section. These birds are valued by the farmers because the station flock has higher egg production and is free from Bacillary White Diarrhea and other diseases. Under the study of the effects of various stimulating practices the tests indicate that the use of light as a stimulant is giving favorable results.



New dairy barns at Coastal Plain Station, showing also new milk house in front and silos behind. In the foreground are two young bulls produced at the Station, and just behind them is a trial grounds area where new grasses and forage crop plants are tested.

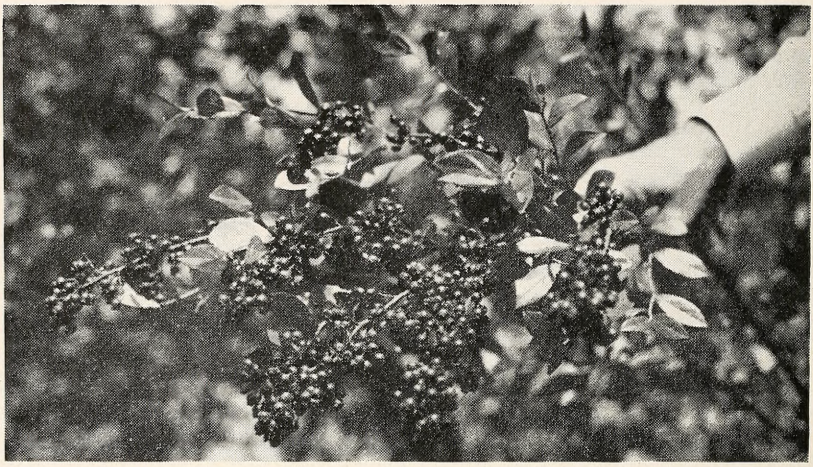
DAIRY

Coöperating with the Bureau of Dairy Industry, U. S. D. A., E. W. FAIRES, *Agent, and the N. C. Agricultural Experiment Station*, C. D. GRINNELLS

The dairy project of the station has now become thoroughly established and the investigations relating to breeding are serving to develop a higher grade of Jersey cattle than we have had at the station heretofore. This is being brought about by the use of superior and proven sires. On the dairy side one of the principal features of the work relates to study of pastures, pasture crops and pasture rotations with a view to getting year-around grazing through the use of a rotation of crops along with pasture areas so that there is a succession of grazing at all times and so that the grazing of animals can be used to a great extent in lieu of the purchase of concentrated feeds. The work of this nature here is of particular importance because the soil types on which the work is being done are the same as those of the vast majority of the farms of the coastal plain section. In this section the soils are slightly acid and more difficulty is encountered in growing leguminous crops than in sections where the soils have a high pH reading.

Some of the principal crops which are being grown in connection with these pasture studies are oats, rye, barley, wheat, Italian ryegrass, Hairy vetch, Oregon vetch, at least four varieties of bur clovers, Ladino clover, White Dutch clover, Reed's Canary grass, soybeans, pearl millet, sudan grass and lespedeza. Through the use of these pastures the cost of producing milk per gallon has been lowered, but certain complications have also been noted at times resulting from carrying the grazing work too far. It appears that there may be danger points beyond which it would be risky to go in substituting succulent grazing crops for the use of concentrated feeds, ensilage and hay. Grazing tests on kudzu are also under way and very comprehensive research studies relating to various pasture mixtures and various pasture fertilizers are also under way under the supervision of forage crop workers.

Climatic Studies in Relation to Jersey Cattle: This study was started in the Spring of 1942 and has to do with the reaction of Jersey cattle to the climatic conditions which exist in this locality.



A typical fruiting branch of Rabbit Eye huckleberries growing on a sandy knoll at the Coastal Plain Station without irrigation. This type of huckleberry should thrive on any North Carolina farm and would furnish the mid-summer fruit supply.

HORTICULTURE

Coöperating with the N. C. Agricultural Experiment Station

Small Fruits (E. B. Morrow and C. F. Williams) : Small fruit studies pertaining to strawberries, raspberries, blackberries, dewberries and blueberries have been continued during the biennium. A number of very promising seedling raspberries have been developed and during the period the Blakemore and Massey strawberries, resulting from breeding work at this station, have been outstanding in the hands of the farmers of the section. It is believed that the additional wealth which these two varieties have brought to the strawberry growers of the section has already far exceeded the entire cost of this station to the State over and above income from the station which the State has received.

Sweet Potatoes (Robert Schmidt) : Under this project continued selections for type and yield of the N. C. strain No. 1 Porto Rico potato has been continued in order to maintain the station strain as a source of registered seed stock. During this biennium, all the seed potatoes which the station could procure from its fields have been distributed to farmers in the State.

Muscadine Grape Studies (Chas. T. Dearing) : The station has established during the biennium three new vineyard blocks in connection with the Muscadine grape research work in coöperation with the Bureau of Plant Industry. One of these blocks is for the testing of selections from breeding work; another block is a variety test, not only of standard varieties, but our own selections and those of other workers in the South. A third

Eleanor Roosevelt strawberries as grown, graded and packed at the Coastal Plain Station. The Station has developed methods of culture, grading and packing, and demonstrated the value of same through its sales on the Wallace cash auction market. The Station's activities along this line have had great influence on the quality of fruit and grading and packing by farmers in this section. Fruit produced and sold at the present time is of much better quality than fruit which was produced before the Station undertook this work.

block has been established which consists entirely of the better selections from Muscadine grape breeding work at this station. This block will serve to demonstrate the progress which has been made in the production of better Muscadine grapes as a result of thirty years of coöperative effort. One of the selections in this block was rated by everyone who saw it and sampled it last season to be much superior to the Scuppernong variety of Muscadine grapes as to flavor and equal or superior to the Scuppernong in other ways; such, for example, as productiveness, bunching character, thinness of skin, character of flesh, vigor of vine, freedom from disease, etc. This selection and several other better ones are now being propagated with a view to their introduction.

TRUCK CROP DISEASE STUDIES

Coöperating with the N. C. Agricultural Experiment Station,
LUTHER SHAW

In the spring of 1940, a new project was begun at the station having to do with the studies pertaining to the disease of truck crops. Special attention has been given during this first season to diseases affecting the bean, cucumber, and melon crops. It is believed that this project is of very great importance to the Southeastern part of the State owing to the vast amount of truck crops which are grown here.

PASTURE STUDIES

Coöperating with the N. C. Agricultural Experiment Station,
R. L. LOVVORN

This project relates to factors affecting the establishment and maintenance of permanent pastures in the lower coastal plain area. The object of this project is to study the effect of various fertilizers on the seasonal yield, total yield and chemical composition of pasture herbage; to study the relative values and adaptations of certain pasture species; to study the competition between species; to study methods of maintaining legumes in an established sod. This test consists of approximately 150 small areas in the station's permanent pasture, each area being seeded to some pasture crop or some combination of pasture crops. It is hoped that results from this area will throw much light on the pasture problems of the coastal plain region.

SOYBEANS

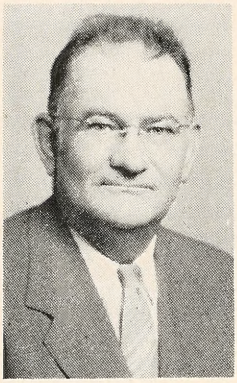
Coöperating with the N. C. Agricultural Experiment Station,
J. A. RIGNEY

The soybean studies are for the purpose of developing superior strains and to compare recent introductions and commercial varieties for adaptability, seed, hay and grazing purposes in Eastern North Carolina. The large seeded Tokyo, Biloxi, and Palmetto were the best seed producers. The Palmetto hay yield of 5,174 lbs. per acre was the greatest of the medium to fine stem varieties; i. e., the hay varieties. This was much greater than the yield of such recognized hay varieties as Otootan and Laredo. All the Biloxi and Mammoth Yellow crosses continue to segregate for shattering. Yield records of all varieties, both hay yield and seed yield, have been secured each year.

SWINE

D. P. SOUTHERLAND

The station has continued its two sow and boar hog project, it being the policy not to increase the hog work at this station beyond this point on account of the presence of large dairy and poultry projects. The purpose of the project is to utilize surplus food crops of the station which would otherwise be wasted for want of market, and second, to provide good pedigreed breeding stock for introduction into the territory served by the station. The steady introduction of such stock into the section over a long period of years has been one of the major factors in improving the swine situation in Southeastern North Carolina. When this work was started, razor backs were the common grade of hogs on farms of the section. At the present time it is almost impossible to find a genuine razor back in this part of the State. The first self-feeder for hogs was also built here at the station. At the present time these feeders can be observed on practically every farm with hogs throughout the section.



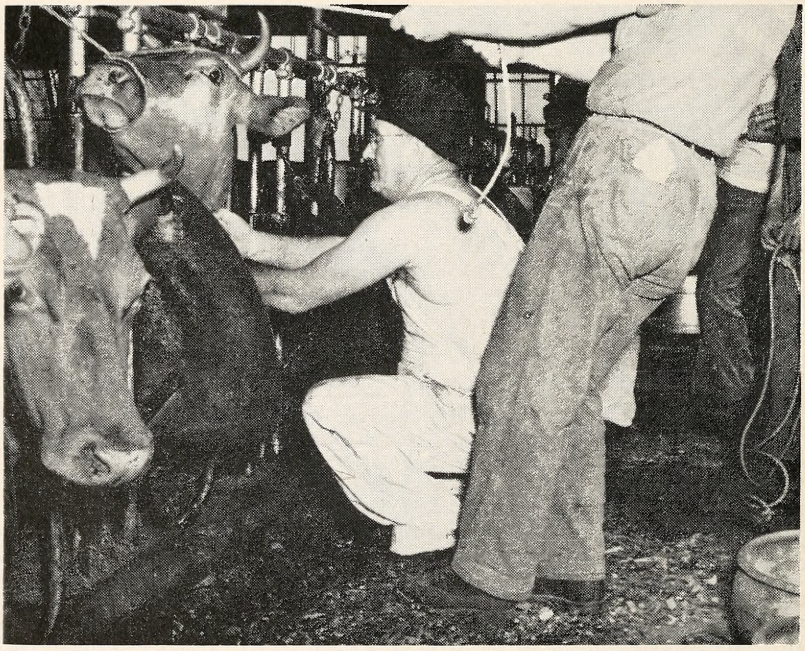
Dr. William Moore

Veterinary Division

Dr. William Moore

Bang's Disease: On July 1, 1942 the last ten of the one hundred counties in North Carolina were placed in the modified accredited Bang's Free Area by the U. S. Department of Agriculture, indicating that Bang's infection had been reduced to below one per cent in the cattle of the state; thus North Carolina became the first state in the nation to become fully accredited for Bang's.

Bang's disease, also referred to as infectious abortion, bovine infectious abortion, contagious abortion, abortion disease, et cetera, is a transmissible disease, due to a specific organism or germ affecting many animals but causing the greatest loss and damage in North Carolina to cattle. This is a very versatile organism—in addition to causing most abortions in cows, it causes many weak calves at birth, most of which die later; it is the cause of considerable breeding trouble, retention of after-

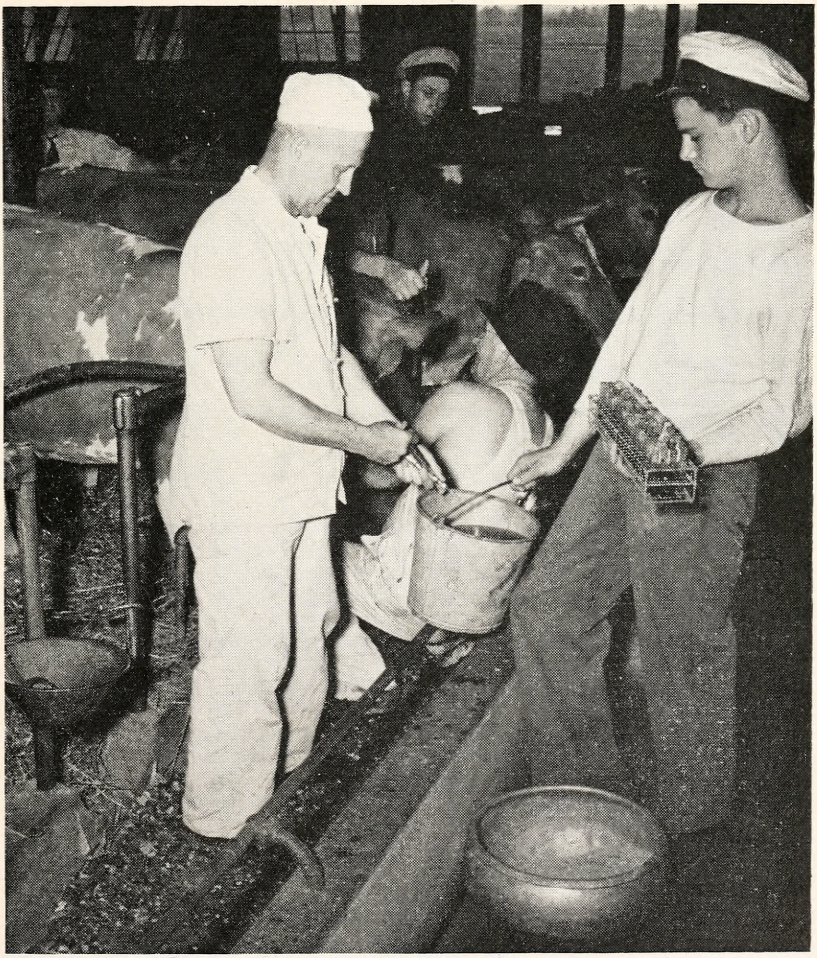


Battling Bang's by bleeding.

birth, temporary and permanent sterility and a great loss in milk production. This disease affects hogs but it has not been found very prevalent although a great many tests have been made and some infection has been found. This disease also affects man and is known as undulant fever, being transmitted to man by contact with infected animals, especially swine, and through the drinking of milk from infected animals.

FIRST TESTING

The first testing for Bang's disease in North Carolina was done in 1927, at which time this Division in coöperation with the North Carolina Agricultural Experiment Station, selected



Victorious veterinarians.

a number of herd owners (25) throughout the state who agreed to coöperate. There were no definite plans and the methods employed in each herd were at a variance. In the beginning, the work was confined to State-owned herds and charitable institutions. A few of the better herds of purebred cattle privately owned were also included in the project. Some of the herd owners agreed to slaughter the reactors, while others isolated them, and a few failed to do anything at all. The results as a whole clearly indicated that it was possible to eradicate the disease with the proper coöperation of the owner. A full report of this work was published in November, 1937, Technical Bulletin No. 54, North Carolina Agricultural Experiment Station.

On July 1, 1934 we entered into an agreement with the U. S. Bureau of Animal Industry for coöperative Bang's disease eradication throughout the state. However, it was impossible to proceed with the work at that time as our laboratory facilities were taxed to the limit in handling the testing of a large number of cattle (more than 100,000) shipped into the state from the drought area of the West. Upon completing the testing of these drought relief cattle, the Bang's disease eradication program was started in September, 1934. From the beginning of this work, the United States Department of Agriculture paid an indemnity to an owner for cattle slaughtered on account of being affected with Bang's disease, based on one-third of the difference between the appraised value and the salvage of the animal and not to exceed $25.00 for grade or $50.00 for pure bred animals. In 1938 Congress provided that no such indemnity could be paid after May 1, 1939 unless such payments were matched by State payments. The 1939 General Assembly made an appropriation (Chapter 272, Public Laws 1939) for the payment of indemnity on the same basis as was then being paid—one-half to be paid by the Federal government.

HERD OWNERS PRAISED

Too much credit cannot be given the owners of herds for the sacrifice they made at the beginning in 1934, as the market was exceedingly low at that time on slaughter cattle, especially of the milk type animal, the beef value salvage averaged about $15.00 per head. The work grew rapidly and we soon had most of the pure bred herds in the state entirely free, and most of them accredited. This enabled us to enlist the influential men, who owned large herds, in a campaign to bring about county-wide testing, with the result that the State Legislature enacted Chapter 275, Public Laws 1937, which became effective July 1, 1937, which provided for coöperation by the Boards of County Commissioners and the testing of all cattle on a county basis. Upon the passage of the Act, we solicited the County Commissioners of the counties whom we knew to be most interested and obtained agreements for the work. The first county in the

state to sign up was Cabarrus, and work was started on July 1, 1937 and completed February 28, 1938. Others followed in quick succession and we were able to keep enough counties signed up to continue the work and progress as rapidly as our personnel would warrant. Little difficulty was experienced in inducing the County Boards of Commissioners to coöperate in most counties, with the exception of about the last dozen counties. The degree of coöperation required of the counties was that they furnish a helper and print the necessary posters for advertising the work. The health departments in most instances gave us splendid coöperation, as did the Dairy Extension Service at State College. Some of the county agents were very active in the respective counties.

A summary of the testing by counties, in the order tested, follows:

Summary of Bang's Disease Area Testing in North Carolina

County	Herds	Cattle	Reactors	Suspects	Reactor Herds	Date Started	Date Finished	% Cattle Infection	% Herd Infection	Date Accredited
					(85 individual-cow reactor herds)					
Wayne	2,585	5,378	177	151	109	7-16-37	2-15-38	1.71	4.21	2-1-40
					(58 individual-cow reactor herds)					
Cabarrus	2,499	7,293	129	138	70	7-1-37	3-1-38	.97	2.80	2-1-40
Yadkin	3,148	6,017	51	177	48	7-20-37	4-1-38	.84	1.52	2-1-40
Davie	2,017	6,050	38	96	34	12-6-37	5-7-38	.63	1.68	4-1-40
Rowan	3,675	10,424	93	185	71	7-20-37	6-30-38	.89	1.93	2-1-40
					(41 individual-cow reactor herds)					
Forsyth	3,529	7,757	100	156	73	8-23-37	6-30-38	.76	2.07	4-1-40
					(24 individual-cow reactor herds)					
Durham	2,056	4,447	91	125	55	4-25-38	10-15-38	1.50	2.67	7-1-40
					(58 individual-cow reactor herds)					
Davidson	4,022	9,139	117	271	89	3-1-38	11-17-38	.65	2.21	4-1-40
					(22 individual-cow reactor herds)					
Lincoln	2,628	6,017	68	158	59	6-16-38	11-26-38	.76	2.24	2-1-40
					(45 individual-cow reactor herds)					
Catawba	3,848	8,505	119	165	66	2-16-38	12-17-38	.87	1.17	2-1-40
					(22 individual-cow reactor herds)					
Beaufort	1,390	3,315	54	91	43	8-1-38	1-16-39	.96	3.09	7-1-40
					(99 individual-cow reactor herds)					
Union	5,478	12,489	218	342	154	2-15-38	1-17-39	.95	2.81	2-1-40
					(57 individual-cow reactor herds)					
Guilford	3,384	10,050	500	503	177	9-7-37	1-31-39	4.40	5.23	7-1-40
					(25 individual-cow reactor herds)					
Gaston	3,381	8,147	81	151	75	6-16-38	2-15-39	.69	2.22	4-1-40
Stanly	2,991	6,328	55	120	47	7-1-38	3-8-39	.87	1.57	2-1-40
					(6 individual-cow reactor herds)					
Gates	677	1,353	14	27	13	1-17-39	4-15-39	.59	1.92	7-1-40
Granville	3,261	6,251	46	132	45	7-5-38	4-17-39	.73	1.07	2-1-40
Iredell	4,928	11,944	118	213	93	5-9-38	4-30-39	.98	1.89	2-1-40
Orange	2,211	5,645	25	81	21	10-15-38	4-30-39	.44	.95	2-1-40
Moore	2,097	3,963	14	63	14	11-28-38	5-15-39	.35	.66	2-1-40
Macon	2,461	5,727	34	114	34	7-16-38	5-27-39	.59	1.38	2-1-40
Wake	5,374	11,459	97	191	81	7-5-38	6-7-39	.84	1.50	4-1-40
Burke	2,686	5,488	12	57	12	1-3-39	6-26-39	.22	.44	4-1-40
McDowell	2,064	3,165	16	32	16	1-20-39	7-25-39	.50	.77	4-1-40
Clay	1,060	2,423	7	28	7	6-1-39	9-9-39	.29	.66	2-1-40
Bladen	2,210	4,157	36	64	32	5-1-39	9-20-39	.86	1.44	2-1-40
Johnston	4,675	8,041	66	99	64	11-1-38	10-12-39	.82	1.37	4-1-40
Anson	2,599	5,704	42	59	33	3-9-39	10-20-39	.73	1.27	4-1-40
					(18 individual-cow reactor herds)					
Cumberland	1,768	3,297	33	33	29	5-15-39	11-15-39	.45	1.64	2-1-40
					(8 individual-cow reactor herds)					
Chowan	415	1,668	22	7	13	9-25-39	12-15-39	.84	3.13	7-1-40
Alleghany	2,041	8,469	15	3	7	10-16-39	4-3-40	.17	.34	7-1-40
Duplin	2,483	5,506	24	9	21	9-21-39	4-16-40	.44	.84	7-1-40
Cherokee	2,145	4,734	15	11	1	9-16-39	3-22-40	.32	.05	7-1-40
Surry	4,982	9,206	26	34	23	5-1-39	3-23-40	,28	.46	7-1-40
Cleveland	5,367	11,516	41	57	39	5-1-39	3-28-40	.35	.73	7-1-40
Jones	647	1,424	14	4	13	4-17-40	5-29-40	.98	2.00	7-1-40
					(7 individual-cow reactor herds)					
Richmond	1,635	3,304	39	20	13	10-23-39	6-1-40	.97	.79	7-1-40
Columbus	1,785	4,242	38	19	13	11-16-39	6-8-40	.89	.73	11-1-40
Bertie	1,154	2,384	15	15	14	4-1-40	8-3-40	.63	1.21	11-1-40
Alamance	3,323	8,879	65	82	28	6-7-39	8-6-40	.73	.84	11-1-40
Washington	691	2,144	19	31	17	6-18-40	8-10-40	.88	2.46	11-1-40
Onslow	953	2,467	13	14	11	4-1-40	8-15-40	.52	1.15	11-1-40
Lee	1,458	3,080	18	51	16	6-1-40	9-10-40	.58	1.09	11-1-40
Madison	3,838	10,279	28	10	19	7-24-39	9-30-40	.27	.49	4-1-41
Rutherford	4,451	8,661	39	78	16	10-24-39	10-9-40	.45	.36	4-1-41
Alexander	2,108	4,596	14	74	14	6-17-40	10-25-40	.30	.66	4-1-41
Pitt	1,765	4,306	38	102	19	6-22-40	11-21-40	.88	1.07	4-1-41

SUMMARY OF BANG'S DISEASE AREA TESTING IN NORTH CAROLINA *(Continued)*

County	Herds	Cattle	Reactors	Suspects	Reactor Herds	Date Started	Date Finished	% Cattle Infection	% Herd Infection	Date Accredited
Hertford	869	1,701	5	16	5	10–17–40	12–14–40	.29	.57	4–1–41
Pender	1,177	2,794	9	52	7	8–16–40	1–14–41	.32	.59	4–1–41
Nash	2,401	4,645	31	58	25	8–14–40	1–31–41	.66	1.04	4–1–41
Vance	2,221	4,072	0	16	0	10–21–40	2–7–41	none	none	4–1–41
Northampton	1,977	3,408	12	49	11	8–26–40	2–19–41	.35	.55	4–1–41
Polk	1,414	3,151	9	28	7	10–9–40	2–22–41	.28	.49	4–1–41
Rockingham	4,503	8,540	12	83	12	1–16–39	3–13–41	.14	.27	9–2–41
Randolph	4,343	10,866	39	192	24	4–1–40	3–20–41	.36	.55	9–2–41
Harnett	3,079	5,846	7	47	7	9–11–40	4–9–41	.12	.22	9–2–41
Montgomery	1,502	3,322	6	46	6	11–18–40	4–9–41	.18	.39	9–2–41
Ashe	4,347	13,929	25	51	20	11–1–39	5–1–41	.18	.46	9–2–41
Perquimans	651	1,917	4	48	4	2–20–41	5–21–41	.21	.61	9–2–41
Watauga	2,917	7,895	7	54	7	8–26–40	5–21–41	.09	.24	9–2–41
Chatham	3,291	8,418	19	170	14	9–9–40	5–23–41	.23	.42	9–2–41
Yancey	2,952	6,696	10	43	10	10–26–40	6–8–41	.15	.34	9–2–41
Tyrrell	513	885	5	3	5	5–13–41	6–21–41	.56	.97	9–2–41
Transylvania	1,080	2,757	7	12	7	4–10–41	7–5–41	.25	.65	9–2–41
					(18 individual-cow reactor herds)					
Wilson	1,507	3,935	54	100	22	11–22–40	7–15–41	.91	1.46	9–2–41
Scotland	1,097	2,025	7	5	7	4–10–41	7–22–41	.34	.64	9–2–41
Camden	613	1,911	18	66	14	1–2–41	7–31–41	.94	2.29	9–2–41
					(6 individual-cow reactor herds)					
Pasquotank	787	3,195	35	84	18	3–10–41	7–31–41	.91	2.29	9–2–41
Caswell	2,691	4,886	10	46	9	3–13–41	8–9–41	.20	.33	9–2–41
Dare	72	278	1	0	1	8–11–41	8–22–41	.36	1.39	4–1–42
Buncombe—1st Test	6,276	19,826	784	548	170	7–1–38	10–31–40	3.95	2.70	
—2nd Test	6,235	17,510	134	428	35	11–1–40	8–31–41	.76	.56	4–1–42
Martin	1,062	2,913	18	18	14	6–3–41	8–31–41	.62	1.32	4–1–42
Greene	1,039	1,846	14	11	14	6–23–41	9–20–41	.76	1.34	4–1–42
New Hanover	302	1,298	12	14	8	9–2–41	10–2–41	.92	2.64	4–1–42
Hoke	1,064	1,746	5	4	5	7–23–41	10–7–41	.29	.47	4–1–42
Halifax	2,713	6,565	32	35	17	5–26–41	10–9–41	.49	.62	4–1–42
Stokes	3,711	6,473	13	79	12	1–17–41	11–6–41	.20	.32	4–1–42
					(3 individual-cow reactor herds)					
Carteret	531	1,643	19	6	5	8–26–40	11–10–41	.97	.94	7–1–42
Henderson	2,476	6,637	42	55	22	7–7–41	11–18–41	.63	.89	4–1–42
Robeson	3,946	7,149	20	89	18	6–10–40	11–24–41	.28	.45	4–1–42
Craven	1,071	2,910	23	15	19	7–17–41	12–8–41	.79	1.77	4–1–42
Brunswick	684	1,574	1	4	1	10–10–41	12–11–41	.06	.14	4–1–42
Avery	2,132	4,370	6	3	6	5–22–41	12–12–41	.14	.28	4–1–42
Currituck	566	2,208	21	15	7	8–28–41	12–12–41	.95	1.24	4–1–42
Franklin	3,014	5,334	14	13	13	7–8–41	12–12–41	.26	.43	4–1–42
Jackson	2,911	6,888	11	58	10	2–1–41	12–17–41	.16	.34	4–1–42
Warren	2,645	5,980	15	17	14	7–8–41	1–8–42	.25	.53	4–1–42
Caldwell	2,708	5,395	6	13	6	7–16–41	2–2–42	.11	.22	4–1–42
Sampson	2,916	5,756	10	32	10	9–2–41	2–6–42	.17	.34	4–1–42
Pamlico	489	1,180	7	11	3	12–3–41	2–18–42	.59	.61	4–1–42
Person	2,927	5,619	4	7	4	9–2–41	2–24–42	.07	.14	4–1–42
Graham	898	1,956	6	2	5	12–12–41	4–11–42	.31	.56	7–1–42
					(15 individual-cow reactor herds)					
Lenoir	1,486	7,089	84	203	27	6–10–40	4–16–42	.97	1.81	7–1–42
					(15 individual-cow reactor herds)					
Hyde	896	2,750	41	51	31	6–20–40	4–23–42	.94	3.46	7–1–42
					(14 individual-cow reactor herds)					
Edgecombe	1,284	8,139	89	210	28	6–1–40	4–24–42	.92	2.18	7–1–42
Mitchell	2,134	5,273	6	14	6	12–29–41	4–27–42	.11	.26	7–1–42
Swain	1,432	2,622	21	35	7	11–24–41	5–13–42	.80	.48	7–1–42
Mecklenburg—1st Test	2,486	11,437	1,422	851	330	6–16–37	1–19–39	12.43	13.27	
—2nd Test	3,765	14,169	65	96	18	10–13–41	5–15–42	.46	.48	7–1–42
Haywood—1st Test	3,421	10,737	296	244	118	12–6–37	1–19–39	2.76	3.44	
—2nd Test	3,589	14,210	112	79	44	11–1–41	5–16–42	.79	1.22	7–1–42
Wilkes	5,389	11,953	23	46	19	5–1–41	5–23–42	.19	.35	7–1–42

No indemnity was paid on 423 reactors as follows:

	Replacements	99
	Failed to slaughter on time	54
(a)	Refused to slaughter	46
	Failed to sign agreement	54
	Unable to furnish certificate of slaughter	33
	Slaughtered before appraisal	32
	Died before appraisal	13
	Sold before appraisal	7
(b)	Grade males	61
	Vaccinated	1
	State owned	19
	Government owned	4

(a) These animals were finally slaughtered.

(b) Most of these animals were replaced by purebreds.

Summary of Bang's Testing October 1, 1934 to June 1, 1942.

	Herds	Cattle
Total under supervision	249,084	601,149
Total tested, including retests	284,601	1,240,668
Total number reactors	20,402	
Total Federal indemnity	$464,069.77	
Total State indemnity	$ 59,311.47	

HOG CHOLERA AND OTHER SWINE DISEASES

In view of the increasing importance of the swine industry (estimated 1,167,000 on farms January 1, 1940) and the enormous loss from diseases that can be controlled, funds were previously made available to employ five veterinary inspectors—the number later being increased to nine—for the purpose of conducting a campaign for the prevention and control of swine diseases in the commercial hog-growing area where the greatest loss occurs. This work is a coöperative project with the United States Bureau of Animal Industry which furnishes two veterinary inspectors, one of whom acts as supervisor.

Inspectors were given a group of counties, from four to six, covering a total of 50 counties which embraces most of the commercial hog growing area. Some work is now being done in about twenty-five additional counties. This project is conducted in coöperation with the State College Extension Service, Division of Vocational Agriculture and the Farm Security Administration under a written memorandum of agreement, the coöperating agencies handling the educational phase while the Department and United States Bureau of Animal Industry handle the disease control. Before placing these inspectors in their territories, they were given all of the available facts concerning diseases in the commercial swine sections, together with such other facts pertaining to the feeding, handling, etc., and they were instructed to go over their respective territories carefully in order to determine just what conditions were present and to make recommendations for the future. The reports from all of these inspectors were similar insofar as the diseases found are concerned,

and the recommendations for their prevention and control. The diseases commonly found were: Cholera, flu, necrotic enteritis, mixed infections, parasites, pneumonia, digestive disturbances, and mineral deficiencies. The less common diseases were: Erysipelas, mastitis, Bang's disease, and tuberculosis. All of the reports indicated that the principal predisposing causes of disease were:

1. The promiscuous use of hog cholera virus.
2. Parasites.
3. The lack of proper swine sanitation.
4. Mineral deficiencies.
5. Unbalanced rations.
6. Lack of proper housing.

In many of these counties serum and virus have been extensively used over a long period of years by county agents, agricultural teachers, and others. It has been known for more than twenty years that hogs given serum and virus would eliminate the virus in their excretions for a period of eighteen to twenty days or more and that susceptible hogs might contract cholera from this source and that serum and virus properly administered to healthy swine would, in practically all cases, produce lasting immunity without bad results, but if administered to hogs affected with flu, mixed infections, necrotic enteritis, and internal parasites or other diseases, that instead of immunizing the hogs, it would, in many instances, produce an outbreak of cholera. Notwithstanding this information, the practice of the promiscuous use of virus, with little regard for swine sanitation, has continued. All of the reports indicate that cholera is much more prevalent in those areas where promiscuous vaccination is widely practiced. As a matter of fact, in several counties where little, if any, vaccination was done, no cholera has been found during the period covered by this report. From the information we have, we are strongly of the opinion that the control of virus, control of livestock markets, and the inauguration of swine sanitation would do more to prevent cholera, as well as other diseases, than anything that could be undertaken. In many counties, county agents and vocational teachers are spending considerable time in administering serum and virus and in nearly every such territory, cholera and other diseases are quite prevalent. In several counties, the county agents are active in the distribution of large amounts of hog cholera serum and virus. Several drug and other stores were found to be offering for sale or selling hog cholera virus in violation of the law, a very dangerous practice. This was corrected wherever found.

In all of the counties, both internal and external parasites are found quite generally and the inspectors report that from 65 to 98 per cent of the hogs examined were found to be infested. Of the internal parasites found, the following are the more important: Ascarides, kidney worm, whip worm, lung worm,

stomach worm, nodular worm, thorny head worm, intestinal thread worm; and the external parasites found are: Lice, chiggers, ticks, and mange. Internal parasites cause a heavy pig loss and it is estimated that of the pigs born in many instances, only fifty per cent are raised, and there is also a severe loss in that the animal fails to make proper gains from the feed consumed—in many instances making less than half of the gain that is made by pigs free of parasites and given the same amount of feed.

The plan of swine sanitation, as perfected by the United States Bureau of Animal Industry a number of years ago, has proved valuable in the control of parasites and filth born diseases. A proper system of swine sanitation in the area referred to will do more to control cholera, parasites, and other common diseases than any other plan that might be adopted and would be the means of making it possible to raise a much greater percentage of pigs and to allow them to make much more rapid gains on the feed consumed. Although swine sanitation is extremely valuable for the proper raising of hogs, yet its benefits are not readily apparent and it is therefore somewhat difficult to have it adopted generally. In many of the counties, little if any progress has been made in swine sanitation by the educational group. If all agricultural agencies will assist our inspectors, this program can be put over but it is going to be necessary to have full coöperation for best results. If a well planned campaign of swine sanitation had been inaugurated and properly carried out in connection with the national plan for increased pork production, North Carolina farmers could have produced more than their requested increase without keeping any additional breeding animals.

Mineral deficiencies seem to be quite general over the entire territory, notwithstanding that information has been available on proper mineral uses for a number of years. In many herds, the hogs showed definite symptoms of a lack of minerals and in these cases it is necessary to use a concentrated form of mineral.

Many diseased conditions were found to be due to unbalanced rations. In many instances owners feed nothing but corn. Considerable work has been done on this but there remains much more to do.

Many diseases were found to be due to improper housing. This is especially the case following sudden changes of weather, during which time flue and pneumonia are quite prevalent. Much could be done to prevent diseases by improving housing conditions. Many pigs are killed by the sow that could be saved by proper housing. Many cases of poisoning from eating salt were encountered and some cases of poisoning by paint and fertilizer were seen, all resulting from the careless handling of these products. Community pastures are a frequent source of outbreaks of disease and present a problem that is difficult, if not impossible, to handle. Public livestock auction markets, referred to else-

where in this report, are responsible for many outbreaks of swine diseases. Such markets must be supervised and regulated if swine diseases are to be controlled. In some counties in which we are working, there is a local law enacted by the Legislature authorizing the county agent and vocational teacher to use serum and virus. In several of these counties, promiscuous vaccination is practiced. The Division's program, of course, must conform to these local laws and it is therefore impossible to restrict the use of virus entirely. We have received splendid coöperation in most of these counties but the question arises as to whether or not work in such counties should be continued without coöperation. In view of the information secured, we have adopted the policy of having our inspectors investigate all reported outbreaks of swine diseases and apply such measures as are indicated for control, to restrict as far as possible the use of virus, and to devote all available time to swine sanitation and to the supervision of live stock markets. With the large territory assigned to each inspector, it is impossible for them to take care of requests for the vaccination of well herds not exposed to disease or to do other veterinary work.

In the interest of this work, it is recommended that the local laws in the seventeen counties permitting the promiscuous use of virus be repealed. During the past year we have vaccinated 141 herds of 2,726 hogs with crystal violet vaccine, a hog cholera immunizing agent perfected by the U. S. Bureau of Animal Industry and used in coöperation with them, to test its efficiency in the field. There have been four breaks in the herds in which it was used, resulting in some loss from cholera. Notwithstanding, this product seems to be of value and has the decided advantage of not producing or spreading cholera.

During the past two years, we have lost three of our veterinary inspectors engaged in swine disease control work, they being called to the Army. These have been replaced with some difficulty.

ANTHRAX

In July, 1941 we encountered an outbreak of anthrax in Alamance County which finally spread to 5 farms on which there were more than 400 cattle, with a loss of about 30 animals. In October, 1941 we had one outbreak of anthrax in Pitt County involving about 50 cattle, 5 of which died. In October, 1941 we had an outbreak of anthrax in Washington County involving one farm and about 180 cattle, 5 of which died from the disease. In October, 1941 we had an outbreak in Anson County involving one farm and about 75 cattle, one of which died from the disease. In November, 1941 we had one outbreak of anthrax in Randolph County involving one farm and about 75 cattle, two of which died from the disease. In June, 1942 we had one outbreak in Forsyth County involving 150 cattle, 5 of which died from anthrax. In this outbreak, a local veterinarian became infected from posting an

animal but made a rapid recovery following the use of serum. A careful investigation was made of all of these outbreaks but we were unable to locate any cause for them except that on each farm Argentine bone meal was being fed as a mineral supplement and while we were not able to isolate the organism in this bone meal, we are very definitely of the opinion that the feeding of this bone meal was responsible for the disease.

Anthrax is a very serious disease and affects man and all animals and is highly fatal unless proper treatment is given promptly. It is also serious because once the disease is established on a farm, it may exist for many years, making it necessary to keep all animals immunized.

CATTLE FEVER TICK

No cattle fever ticks have been found during the period covered by this report, notwithstanding that we have made a very large number of inspections in all sections of the state. Cattle fever ticks have not been found since 1931, at which time a small outbreak was found in Sampson County and completely eradicated.

BOVINE TUBERCULOSIS

Work in the eradication of this disease has been confined to the testing in counties on which the three-year accreditation period has expired, State owned herds, herds of charitable institutions, herds to which imported cattle have been added, and herds known to be infected. The following is a summary of the testing done by Federal-State-Municipal and practicing veterinarians during the period covered by this report:

July 1, 1940-July 1, 1942

	No. Cattle Tested	No. Reactors
July, 1940	3,601	
August	1,851	
September	2,216	
October	2,108	
November	3,724	
December	2,887	
January, 1941	1,544	
*February	2,701	2
March	3,497	
April	4,314	
May	4,404	
*June	3,001	2
July	2,762	
August	3,432	
September	2,738	
October	1,809	
November	3,273	

*All reactors from same herd.

	No. Cattle Tested	No. Reactors
December	2,469	
January, 1942	3,278	
February	2,633	
March	3,260	
April	4,221	
May	3,538	
June, 1942	3,545	

Many of these animals did not show visible lesions and others showed only slight lesions. We can, therefore, say that this disease has been practically eliminated from the cattle of this state. All of the diseased animals referred to were slaughtered and the owners were paid an indemnity of one-third of the difference between the appraised value and the salvage, not to exceed $12.50 for grades and $25.00 for purebreds, a like amount being paid by the U. S. Department of Agriculture.

Numerous requests for testing are received which we are not able to handle. We consider this a purely personal service and in many instances the cost of testing would be greater than the value of the animals tested. Such testing can be done by local veterinarians at much less cost than the expense to the State.

PULLORUM DISEASE CONTROL, HATCHERY AND FLOCK INSPECTION, AND BREED IMPROVEMENT WORK

A satisfactory program of blood testing poultry flocks for the elimination of pullorum disease and selecting breeding stock under the National Poultry Improvement Plan was carried on with more than 100 hatcheries during the two seasons covered by this report. The rapid stained antigen test has been used with very satisfactory results. The following is a summary of the work for the past 11 years:

Year	Number Flocks Tested	FIRST TEST		SECOND TEST		Total Samples Tested
		Number Birds	% React.	Number Birds	% React.	
1931-32	424	64,702	4.02	30,669	3.43	105,289
1932-33	542	83,057	4.32	35,488	2.67	120,224
1933-34	385	68,098	4.15	31,631	1.98	102,102
1934-35	702	98,381	3.03	28,075	2.34	126,456
1935-36	756	117,384	3.51	36,167	1.11	153,551
1936-37*	1,199	198,545	3.03	78,860	2.08	285,590
1937-38	1,070	195,080	3.52	123,843	1.36	328,693
1938-39	1,656	314,120	1.94	171,433	0.78	486,553
1939-40	1,785	394,383	1.99	195,289	0.75	589,672
1940-41	1,706	382,475	1.509	129,382	0.97	511,857
1941-42	2,308	568,340	1.306	72,174	0.98	640,514

*National Poultry Improvement Plan adopted.

As the Official State Agency for administering the National Poultry Improvement Plan, we are committed to close coöperation with the U. S. Department of Agriculture, Bureau of Animal Industry, in a plan for the control of pullorum disease and in the general improvement in the quality of poultry in North Carolina.

Official state inspectors cull and blood test all selected breeding birds in flocks that supply hatching eggs to state supervised hatcheries. All culls and birds reacting to the pullorum test are marked and removed immediately from the flocks and sold for slaughter. All supervised hatcheries are inspected at regular intervals in order to make sure that hatching eggs and baby chicks are culled according to regulations and to see that hatcheries are kept in a sanitary condition at all times and all eggs and machines are regularly fumigated as a further precaution against the spread of pullorum disease. With this test, when supported by strict sanitation and the proper brooding of chicks on the part of the flock owner, pullorum disease can be controlled almost 100%, but without this coöperation the test will merely hold the infection down to a low percentage.

As a result of careful selecting of breeding flocks, the introduction of good breeders, the selecting of hatching eggs, and the culling of baby chicks for sale, the quality of poultry in North Carolina has greatly improved. Due to the testing and retesting of breeding birds for a number of years, the incidence of pullorum disease among poultry flocks in this state has been materially reduced.

The popularity of this work is revealed in the above table which shows a great increase in the demand for this service for the last several years. The important service which this breed improvement and pullorum disease control work is rendering poultrymen and hatcherymen is paying excellent dividends to poultrymen who, in response to the urgent appeal by Secretary of Agriculture Wickard, are doing their part in increasing the production of poultry and eggs in the Food-For-Victory program.

RABIES

The general operation of the State Rabies Law, Chapter 122, Public Laws 1935, so far as the Department is concerned, was placed in this Division early in 1935 and has been continued. This is another dog law that does not seem to be very well observed. During the 1935 season, 62 counties made some effort to comply with the law but in only a small number of counties was vaccination done extensively. We distributed during the 1935 season 63,370 doses of vaccine and with vaccine purchased from other sources, it is estimated that about 100,000 dogs were vaccinated, representing probably less than 25% of the dog population of the state.

During the 1936 season, there were about 36 counties that made some effort to comply with the rabies law and only a small number of these counties vaccinated the greater percentage of the dogs. More than 50,000 doses of vaccine were distributed in 1936 during the season and considering vaccine purchased from other sources, it is estimated that there were about 75,000 dogs vaccinated. In 1937 we distributed 10,000 doses of vaccine and in 1938, 8,550. There were about seventeen counties that coöperated during 1937 and about ten in 1938. In 1939 we distributed 7,090 doses; in 1940, 4,000 doses, in 1941, 4,118 doses and 3,760 doses in 1942. Seventeen counties coöperated to some extent and fifteen in 1940, and a few less in 1941 and 1942, which shows a gradual falling off in the use of vaccine under the law. Estimates on the number of dogs in the state run from 200,000 to 1,000,000. It would be safe to assume that there are at least 500,000 dogs in the state. We estimate that there were 100,000 dogs vaccinated in 1935; 75,000 in 1936; 25,000 in 1937; and perhaps 15,000 in 1938 and about the same for 1939, 1940, 1941, and 1942. Taking the highest number in any year, 100,000 in 1935, there would be only about 20% of the dog population vaccinated in widely scattered areas and this certainly could not be responsible for any great reduction in rabies even though we assume that the vaccine is highly efficient. During the past few years, several counties in which rabies had been prevalent worked out a program of vaccination by the local practicing veterinarian, not strictly in accordance with the law but which has apparently given good results. The original rabies law (Chap. 122, P. L. 1925) was amended by Chapter 259, Public Laws 1941 providing for quarantine on account of rabies by the local health department instead of the Department of Agriculture, increased the fee so as to allow for the use of better vaccine, provided for more extensive use of the services of the practicing veterinarian and otherwise corrected certain ambiguous phases in the law, all of which is considered an improvement.

One of the most important things in the control of rabies is the elimination of stray and worthless dogs. This is a difficult accomplishment and seems impossible under the present law. We doubt the advisability of state-wide vaccination but believe that such vaccination should be confined to areas where the disease is known to exist.

EQUINE ENCEPHALOMYELITIS

This is a specific disease affecting horses and mules and has probably existed in this state for a number of years, causing in some years very serious losses in some sections. The disease is also known under the names of blind staggers, forage poisoning, etc. It has recently been found that this is a virus disease and experimental work seems to indicate that it is transmitted by mosquitoes and perhaps other biting insects. There was some

loss during the summer of 1937 and 1938, while there were only a few cases in 1939; none reported to July 1, 1940; thirty-five in 1941; and five to July 1, 1942. There are two types of this disease known as the eastern and western. So far, we have only encountered the former but since there are many horses and mules shipped from the west, it is reasonable to expect that we may have to contend with both types. A severe outbreak of this disease occurred in the western part of the United States in 1937, involving more than 100,000 horses and a larger outbreak followed in 1938. Satisfactory methods for the control of this disease have not been determined, although a vaccine has been perfected that is highly satisfactory in immunizing an animal.

A Laboratory for the Diagnosis of Animal Diseases

For many years we have realized the urgent need of a laboratory in which we could make examinations for the diagnosis of animal diseases. Funds were finally arranged for this laboratory and same was started July 1, 1940, with Dr. M. A. Schooley, a veterinarian, in charge. We found this laboratory very useful and in great demand by veterinarians and livestock owners throughout the State as it is frequently necessary to have a laboratory examination in order to diagnose a diseased condition satisfactorily. During 1941 a project on mastitis control was started in coöperation with the North Carolina Agricultural Experiment Station, the laboratory work being done in our laboratory. This work was very popular and if it had been possible to continue it, much good could have been accomplished. In the spring of 1942, Dr. Schooley was given an attractive offer by the Pathological and Bacteriological Department of the University of Illinois and he accepted same on June 1, and in about thirty days he was called into the Army as he was a reserve officer. Since he left, it has not been possible for us to locate anyone to take charge of this laboratory except those who are subject to military service and it is therefore necessary to discontinue this project for the duration.

Public Livestock Auction Markets

During recent years there have sprung up in all parts of the State public livestock markets, there now being thirty of these. At most of these markets a public auction sale is held one day of each week and all classes of animals are brought in for sale, not only by farmers but by livestock dealers and peddlers. Many of these markets are the outgrowth of a former horse and mule sale stable. Such markets perform a useful service in that they offer a market to the farmer who may have only a small number of animals to sell; but on the other hand, they offer a real problem in animal disease control for

the reason that many diseased or exposed animals are offered for sale and sold at these markets. Many outbreaks of cholera are started by hogs passing through these markets. The unrestricted movement of livestock by truck, often by irresponsible peddlers who sell the livestock to farmers, results in the spread of animal diseases.

A bill was presented to the 1941 General Assembly providing for supervision and regulation of such markets by this department. This bill was finally, after considerable change, enacted into law, Chapter 263, Public Laws 1941. Briefly, the law provides that the Commissioner of Agriculture within his discretion may grant a permit for the operation of such markets; provides for the sanitary construction and maintenance of such markets and sets up certain health requirements for animals that are returned to the farm as feeding or breeding animals. This law has been found quite effective but needs some amendments in order to properly control animal diseases that are often spread through such markets. Most of these markets have given the department splendid coöperation, although there are two at this time which have not complied with the law and regulations issued thereunder. In order to carry out this law, it is necessary to give these markets close supervision and this has been found difficult with our limited personnel.

Miscellaneous

We have a very large number of requests to investigate reports of outbreaks of disease. It has not been possible for us to take care of all of this on account of the greatly increased amount of laboratory and other work and a lack of personnel. Many of these requests for assistance are for a purely personal service that could be taken care of at less expense and entirely satisfactorily by the local practicing veterinarian. This presents one of the most unpleasant problems with which this division has to deal. Many livestock owners apparently believe that the State should supply them free and prompt veterinary service for all occasions. This, of course, is impossible and, I think, undesirable. We have followed the policy of investigating, so far as time and funds will permit, those reports that indicate that a serious contagious disease exists that without help might spread and seriously affect the livestock industry, and investigation is also made when a large number of animals are affected and the cause cannot be determined.

We are glad to report that no sheep scabies, or glanders have been encountered during the period covered by this report, although these diseases have previously existed in this State and we are constantly on the lookout for them. A few isolated cases of blackleg have been reported. Infectious keratitis, a serious disease affecting the eyes of cattle, seems to be on the increase. Much of this was brought in by E.R.A. cattle and

live stock markets are responsible for much of the spread of this disease. A satisfactory method of control has not been worked out. John's disease or paratuberculosis was encountered in one herd in Pender County. Several diagnostic tests were applied and two reactors removed. It is believed that the disease has been eradicated in this herd.

We have continued to look after the health of live stock on the twenty-two State owned farms and have made considerable effort, with success, to prevent disease among the live stock. We have continued to look after the health of the live stock on the prison farms and have found it necessary to keep all of their hogs vaccinated. Practically all of the prison camps have more or less farm land and on nearly all of them hogs are produced. Since all of these camps feed garbage from the prison kitchen, which is a prolific source of cholera, we believe that it is essential that these hogs be immunized against cholera. We have, therefore, inaugurated a systematic plan of vaccinating all of the hogs at these camps.

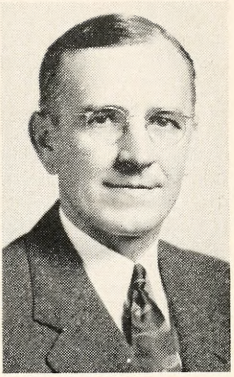
CLINICS

Funds were made available for holding clinics in connection with breeding troubles and mastitis in dairy herds but satisfactory arrangements could not be made during 1941 and it was necessary to abandon them in 1942 on account of the tire and gasoline situation.

Breeding troubles and mastitis are urgent problems facing the dairy industry and it is hoped that this work may be continued after the war is over.

Warehouse Division

A. B. Fairley



A. B. Fairley

The State Warehouse System during the biennium of 1940-41 and 1941-42 had licensed one hundred and seven (107) cotton storage warehouses, the total storage capacity being 535,000 bales. These warehouses handled a large part of the North Carolina cotton crop during the past two years. During the year 1941-42 there were 542,225 bales handled through the warehouses, or about seventy per cent of the year's total crop.

A few new warehouses were licensed, and warehouses are now located in the majority of the cotton producing counties.

Cotton Classing

The new cotton classing building has proved to be of great benefit. Immediate service can now be rendered the producers desiring information as to the grade and staple of cotton produced. About forty thousand bales were graded and stapled by the State classers, and they assisted the Federal Department in grading and classing one hundred thousand bales.

The coöperative agreement with the Federal Government was continued whereby each agency assisted the other in any classing work.

The cotton gin service was continued and the efforts of the gin specialist directed along dual lines of service, namely, inspection of ginning equipment and coördination of the efforts of all other cotton groups and agencies interested in better ginning. These services have contributed to the steady improvement of the gin service in North Carolina.

Ginning Improvement

Official classing records (Smith-Doxey) indicate that the percentage of cotton lowered one or more grades because of improper ginning has been reduced approximately 2½% annually for the past three seasons, reaching an all-time low of 6.8% in 1941. Compared to similar records in other states these results are very gratifying.

The Legislature of 1941 amended the Warehouse Act whereby other commodities can now be stored in State licensed warehouses, receiving the same benefits as cotton.

The weight testing truck has been kept in operation, and

Grading and classing cotton.

through continued coöperation with the Weights and Measures Division gin scales throughout the State were tested.

The warehouses at Benson and Norlina, which belong to the State, were operated and continue to bring in good revenue.

A few loans were made to new warehouses, and substantial payments have been made on old loans, so they are now in good shape. The new loans are as follows:

Farmers Bonded Warehouse, Columbus, N. C.	$ 4,500.00
Forrest Pollard Warehouse, Raleigh, N. C.	18,500.00
W. E. Webb, Jr., (Seville Bonded) Statesville, N. C.	10,000.00
TOTAL	$33,000.00

Below is listed the amount collected during the biennium, and the financial standing of the State Warehouse System:

Interest	$28,177.72
Principal	50,542.76
TOTAL	$78,720.48

	Cash on Hand Principal Fund	Cash on Hand Supervision Fund	Loans 1st Mortgage on Whse.	Invested In Bonds
1940-41	$35,562.48	$44,861.01	$278,058.57	$330,500.00
1941-42	56,851.09	48,682.22	260,613.69	325,500.00

Weights and Measures Division

C. D. Baucom

C. D. Baucom

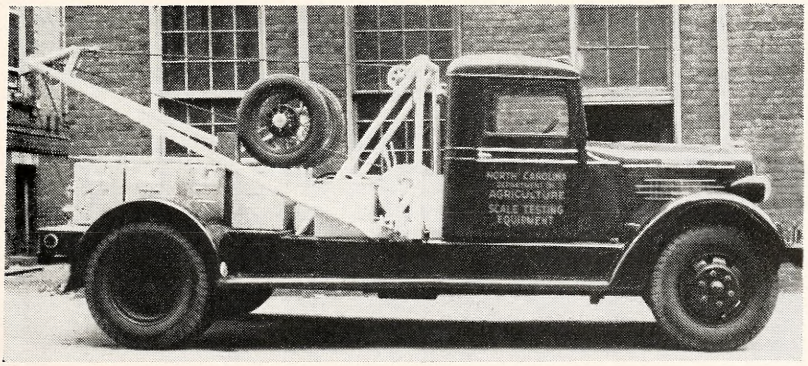
During the past biennium, the services rendered by this Division have greatly increased due to the fact that the General Assembly of 1941 increased our appropriation $7,200, thereby enabling us to appoint two additional full time general inspectors and a helper to work with our heavy duty scale testing outfit.

The personnel of this Division now consists of the following:

State Superintendent
1 Secretary
5 State Inspectors—full time
1 City Inspector (Asheville)—full time
1 County Inspector (Mecklenburg)—full time
1 Helper—full time
2 Inspectors during tobacco warehouse season—temporary.

The county and city inspectors are appointed and paid by local authorities but their work comes under State supervision.

The Scale Mechanic Act as passed by the General Assembly of 1941, was enacted for the protection of both the owners of scales and the honest mechanic who renders services thereon. There are now forty registered scale mechanics in this State.



Heavy duty scales testing truck.

The Weigh Master Act of 1939 was amended in 1941 and now seems to have the full approval and support of all parties concerned, thereby resulting in maximum benefit to the farmers, warehousemen and the buyers of tobacco at the tobacco warehouse auction sales.

The work accomplished during the past two years (July 1, 1940-July 1, 1942) is as follows:

BY STATE INSPECTORS

	Approved	Condemned	Confiscated	Released	Total
Scales	18,999	2,641	283	653	22,576
Weights	14,248		1,089		15,347
Dry Measures	522		13		535
Liquid Measures	70		26		96
Packages	81,510	27,249			108,759
Deliveries	84	5			89
Grand Totals	115,433	29,895	1,411	653	147,402

Number of Places Visited 11,225
Prosecutions 60

BY MECKLENBURG COUNTY

	Approved	Condemned	Confiscated	Released	Total
Scales	2,967	197	17	99	3,280
Weights	2,158		32		2,190
Liquid Measures	30				30
Packages	10,965	255			11,220
Deliveries					
Grand Totals	16,120	452	49	99	16,720

Number of Places Visited 1,051
Prosecutions ..... None

BY ASHEVILLE

	Approved	Condemned	Confiscated	Released	Total
Scales	2,842	95	1	47	2,985
Weights	2,459		15		2,474
Dry Measures					
Liquid Measures					
Packages	11,737	1,038			12,775
Deliveries					
Grand Totals	17,038	1,133	16	47	18,234

Number of Places Visited 1,223
Prosecutions 3

TOTAL OF STATE, CITY, AND COUNTY INSPECTORS

	Approved	Condemned	Confiscated	Released	Total
Scales	24,808	2,933	301	799	28,841
Weights	18,865		1,136		20,001
Dry Measures	522		13		535
Liquid Measures	90		26		116
Packages	104,212	28,542			132,754
Deliveries	84	5			89
Grand Totals	148,581	31,480	1,476	799	182,336

Prosecutions	63
Number of Places Visited	13,499
Tank Trucks Calibrated	83

We are very proud of the results of the Weigh Master Act affecting tobacco warehouses. During last season, we made 1,112 visits to the warehouses, re-weighed 5,045 baskets, amounting to 563,882 pounds which showed a net error of only 1,120 pounds over a lapse of time averaging 5 hours. This error is equal to 2 pounds per 1,000 or .2 of 1%. The reason for this great improvement in weighing tobacco is due to the coöperation of the warehousemen and to the fact that all weighers in the warehouses must first, obtain a license and second, they are subject to rigid penalties if they issue false weight tickets or in any way misrepresent the weight to either the farmers or other interested persons. Careful supervision has resulted in both the warehousemen and the buyers becoming more conscious of the importance of the weighing act and the necessity of protecting the tobacco while both on the warehouse floor and in transportation from the warehouse to storage depot. The Weigh Master Act is supported in part, by a license fee collected from each weigh master. These fees amount to about $3,000 per annum.

In the Budget Request of 1943-45, we are asking for an additional appropriation sufficient to employ the two temporary inspectors full time. It is very difficult to employ competent men for a temporary period and too, their services are greatly needed throughout the entire year in carrying out the mandates of the Uniform Weights and Measures Act. It is also requested that funds be provided for the purchase of a lighter weight heavy duty scale testing truck for use in western part of the State in testing cattle scales and the like. This will require another inspector and helper, full time. This service is in constant demand, though we are unable to render same with the one and only outfit that we now have, if we test the coal scales and other truck scales in the State.

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